OPERATIONS TRAINING 01/08/03

1. **HEAT RATE/ PERFORMANCE**
   Definition:
   How calculated? Input/ Output, NTCHR/ Boiler Eff, Gas Outlet Method

   Heat Rate Accounting Program
   Monthly Performance Testing- determine equip & operational problems
   Monthly Production Reports

   Issues- coal flow measurement accuracies
   calibrations
   monthly corrections
   Annual Coal Pile Inventory Reconciliation
   Basis for FYE NSHR

   HRIP- Operator Controllable Parameters

   Turbine- U1 vs U2 Sliding Pressure & Throttling
   Condenser- backpressure
   Feedwater Heaters diagnostics
   Boiler- sootblowing guidance
   Air Heaters& Air Preheat System

2. **PREDICTIVE MAINTENANCE PROGRAM (PdM)**
   Program Overview- (Engineering Services Breakdown, Results Group Personnel)
   Monthly Meetings & Reports

   Operators- eyes and ears
   Performance Testing- Monthly & Ad Hoc
   Cycle Isolation- valves steam traps
   Vibration Analysis (rotating equipment)
   Lube Oil Analysis (rotating equipment)
   Infrared Analysis
   Electrical Motor Testing
   Transformer Oil Gas Analysis
   PI (data acquisition system)- bearing temps, motor temps, etc..

3. **UNIT UPRATE**
   Schedule: 04/2002 U2 900 MWg, HP Turbine replacement
   04/2003 U1 950 MWg, HP, Boiler & CT
   04/2004 U2 950 MWg, Boiler, CT & replacement burners

   Unit Operation- more efficient HP turbine, plus increased steam flow

   Turbine- Alstom HP
   Boiler- Superheater Platen Extension
   Overfire Air
   Safety Valves- ERV
   Helper Cooling Tower
   Circulating Water Pumps
   Startup testing Requirements

   Scrubber Modules Upgrades (on-going)
   Ring Wall Header, Cladding & Forced Oxidation System

   DCS and Simulator replacement (near future)

4. **ENVIRONMENTAL EMISSIONS**

State of Utah Environmental Regulations
WEPCO Ruling
NOx
SO2
PM10

NOx targets
target vs actual screens

NOx Operator Control Guidelines
O2- targets
O2 probe calibrations
East/ West splits- secondary air dampers

Coal feeder calibrations

Pulverizer Biasing- nagative impact on flames

FEGT- waterwall sootblowing

Upper Pulverizers- out of service

6 pulv operation (O2 curve w/ pulv oos)- fuel rich

Sec Air Temp (air preheat setpoint)

Pulverizer performance & fineness- take bad actors oos

Lower Fireball- bias lower pulverizers

Coal Source- Westridge (high in S& N2)
Stockpiling- really important over next 3 months to stockpile ALL Westridge Coal
Coal Blending- future

Overfire Air control

Pulverizer Issues
Maintenance Issues
Overhaul turnaround time, spare parts, gearbox overhauls,
grinding segment profiles, keeping capacity & performance levels
Rotating Throats
Reducing primary air flow
Fineness- background
Capacity (should have 6 pulv capability)
Biasing Primary Air Flow- increases velocity & decreases fineness
Also impacts flame shape for optimum NOx
Pyrites- bias, only if a lot of coal dribble
Must tolerate rejecting rock (more manpower intensive)
Don't increase hydraulic skid pressure setpoint
Only minor mods to pyrite, major overhauls postponed

ISG/ Fly Ash Issues- still plan on marketing flyash
Optimization with overfire air, between NOx and LOI

INTERMOUNTAIN POWER SERVICE CORPORATION

INTERMOUNTAIN GENERATING STATION

MONTHLY PRODUCTION REPORT
DECEMBER, 2002

GENERATION

Station		Unit #1	Unit #2	Facility
Gross Generation	(Mw-hr)	640,265	652,064	1,292,329
Auxiliary Power	(Mw-hr)	32,904	33,847	66,751
Percent Aux Power	(%)	5.14	5.19	5.17
Net Facility Generation	(Mw-hr)	607,361	618,217	1,225,578

HEAT RATE

		Unit #1	Unit #2	Facility
Gross Unit Heat Rate	(Btu/kw-hr)	9,097	8,847	8,971
Net Facility Heat Rate	(Btu/kw-hr)	9,590	9,332	9,460

FUEL

USAGE		Unit #1	Unit #2	Station
Coal Usage	(tons)	247,492	244,917	492,409
Fuel Oil	(gallons)	4,931	40,387	45,318
Fuel Oil Heat Input	(%)	0.01	0.10	0.05

INVENTORY		Starting Inv	Deliveries	Usage	Ending Inv
Total Coal	(tons)	971,571	434,365	492,409	913,527
Fuel Oil	(gallons)	887,796	0	45,318	842,478

QUALITY

Coal (as-fired)			Fuel Oil (as-fired)		
Heating Value	(Btu/lb)	11,766	Heating Value	(Btu/lb)	19,373
Sulfur	(%)	0.56	Density	(lb/gal)	7.26
Ash	(%)	9.69	Sulfur	(%)	0.29

AQCS PERFORMANCE

		Unit #1	Unit #2
Stack Opacity	(%)	1.50	4.40
SO2 Emissions	(lbs/MBtu)	0.05	0.04
Scrubber Removal	(%)	94.0	95.0
NOx Emissions	(lbs/MBtu)	0.39	0.37

INTERMOUNTAIN GENERATING STATION

2002 PHYSICAL COAL INVENTORY AND BOOK VALUE SUMMARY

	DENSITY (lb/cuft)	VOLUME (cuyd)	WET TONS	% TOTAL WET TONS	DRY TONS	AVE % MOIS.
LONG TERM STOCKPILE------	73.13	300,728	296,912	29.46%	273,010	8.05%
SETTLEMENT----------	73.13	4,239	4,185	0.42%	3,848	8.05%
WORKING STOCKPILE -------	65.82	621,001	552,440	54.82%	511,117	7.48%
SETTLEMENT----------	65.82	4,593	4,081	0.40%	3,776	7.48%
ACTIVE RECLAIM----------	57.25	61,652	47,649	4.73%	44,085	7.48%
EMERGENCY----------	65.82	100,039	88,892	8.82%	82,243	7.48%
MISCELLANEOUS PILES------		0	0	-		
IN-PLANT STORAGE---------			13,588	1.35%	12,572	7.48%
**INVENTORY TOTAL----------			**1,007,748**	100%	930,651	
**IPSC BOOK VALUE----------			**1,009,864**			
DIFFERENCE----------			2,116			
PERCENT OF BOOK VALUE---			0.21%			
6/6/01 - 6/5/02 TOTAL BURN-			5,333,173			
DIFFERENCE----------			2,116			
PERCENT OF TOTAL BURN---			0.04%			
IPSC Book Value Correction to 0.0% of Physical Inventory			-2,116			
6/30/02 (END OF MONTH VALUES)						
INVENTORY VALUE---------			**1,046,641**			
IPSC BOOK VALUE---------			**1,046,641**			

NOTES:

Long term and working stockpile tonnage calculated using isopach tonnage at 2' horizontal intervals. The remainder of the inventory tonnage calculated using total volumes and average densities.

Physical coal inventory and IPSC book values calculated at 13:05 MDST on June 5, 2002.

INTERMOUNTAIN POWER SERVICE CORPORATION

INTERMOUNTAIN GENERATING STATION

MONTHLY PRODUCTION REPORT
FISCAL YEAR TO DATE (7/1/01 - 6/30/02)

GENERATION

Station		Unit #1	Unit #2	Facility
Gross Generation	(Mw-hr)	7,139,814	6,855,610	13,995,424
Auxiliary Power	(Mw-hr)	379,010	365,670	744,680
Percent Aux Power	(%)	5.31	5.33	5.32
Net Facility Generation	(Mw-hr)	6,760,804	6,489,940	13,250,744

HEAT RATE

		Unit #1	Unit #2	Facility
[1] Gross Unit Heat Rate	(Btu/kw-hr)	9,041	9,016	9,028
[1] Net Facility Heat Rate	(Btu/kw-hr)	9,547	9,524	9,536

FUEL

USAGE		Unit #1	Unit #2	Station
Coal Usage	(tons)	2,726,754	2,611,316	5,338,070
[2] 6/5/02 Inv Correction	(tons)	1,081	1,035	2,116
[2] Corrected Coal Usage	(tons)	2,727,834	2,612,351	5,340,186
Fuel Oil	(gallons)	291,534	228,410	519,944
Fuel Oil Heat Input	(%)	0.06	0.05	0.06

INVENTORY		Starting Inv	Deliveries	Usage	Ending Inv
[2] Total Coal	(tons)	874,285	5,512,542	5,340,186	1,046,641
Fuel Oil	(gallons)	837,984	706,298	519,944	1,024,338

QUALITY

Coal (as-fired)			Fuel Oil (as-fired)		
Heating Value	(Btu/lb)	11,824	Heating Value	(Btu/lb)	19,235
Sulfur	(%)	0.57	Density	(lb/gal)	7.23
Ash	(%)	9.76	Sulfur	(%)	0.29

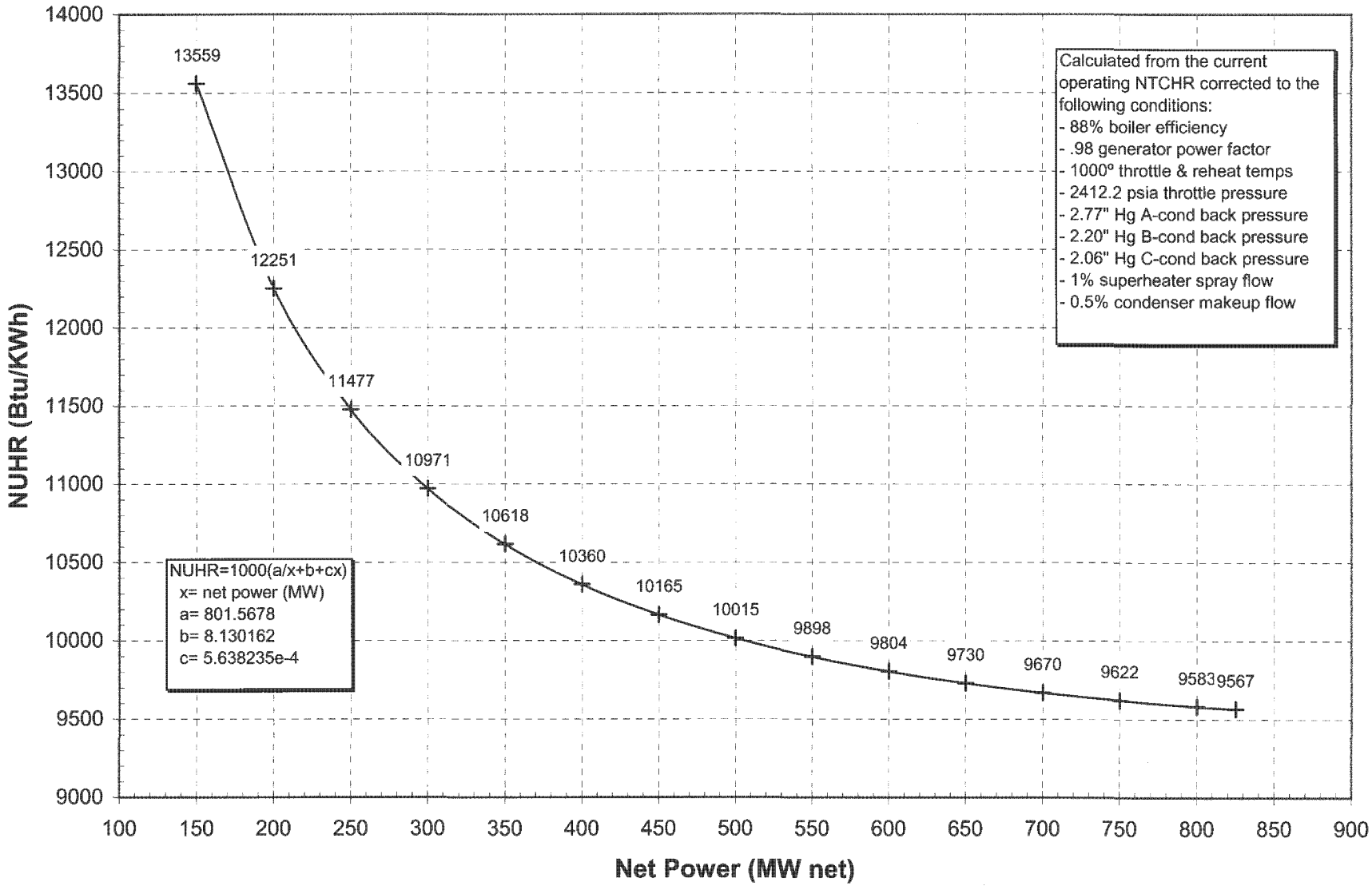
AQCS PERFORMANCE

		Unit #1	Unit #2
Stack Opacity	(%)	2.23	3.01
SO2 Emissions	(lbs/MBtu)	0.06	0.05
Scrubber Removal	(%)	93.8	93.8
Nox Emissions	(lbs/MBtu)	0.43	0.41

[1] Heat rates calculated using corrected coal usage.
[2] Coal use correction based on 6/5/02 stockpile book value adjustment to the physical inventory value.

INTERMOUNTAIN GENERATING STATION - Unit 1

Operating Net Unit Heat Rate Curve

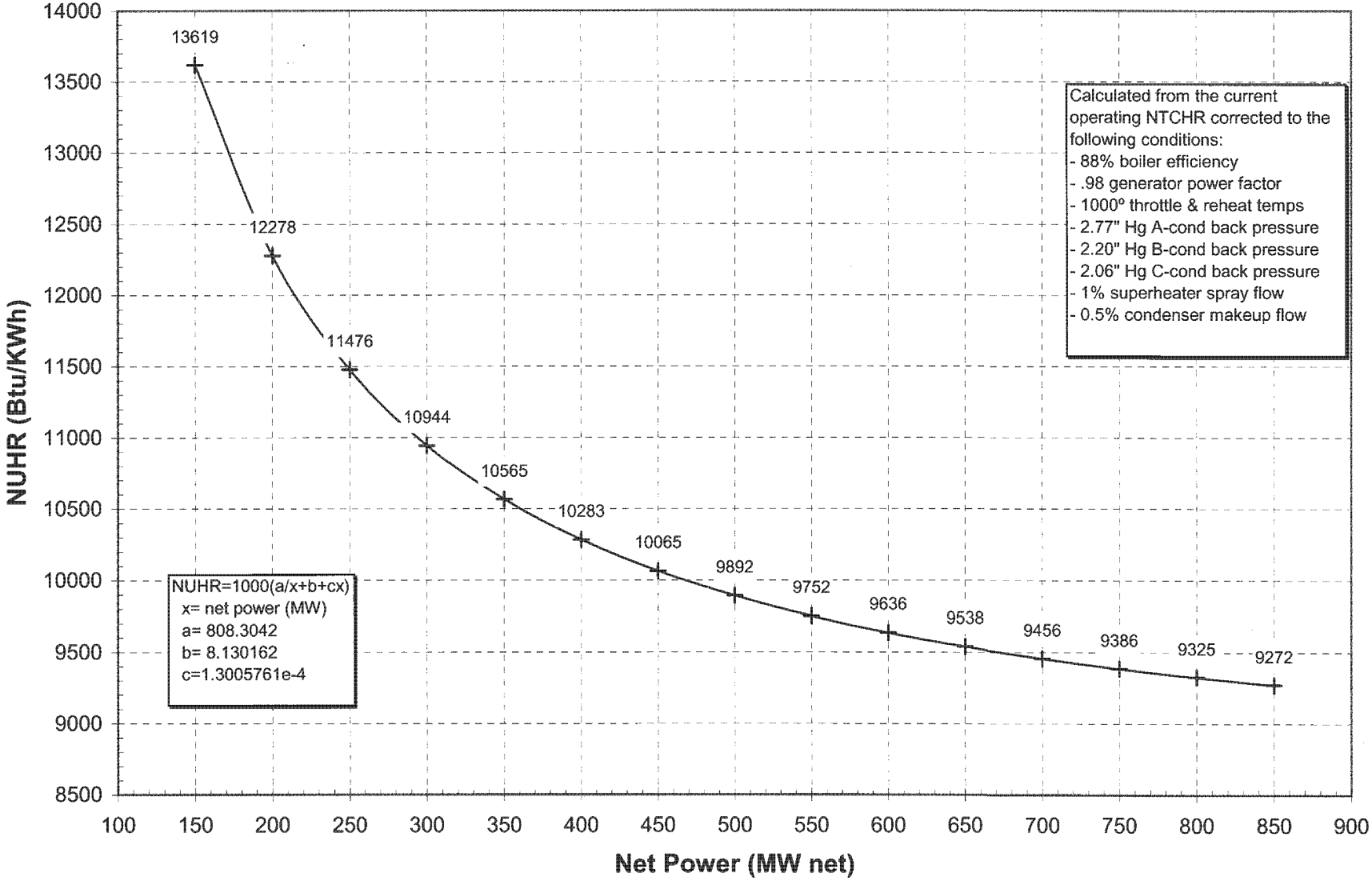


U1 op nuhr.xls 1/8/2003

IP7010934

INTERMOUNTAIN GENERATING STATION - Unit 2

Operating Net Unit Heat Rate Curve

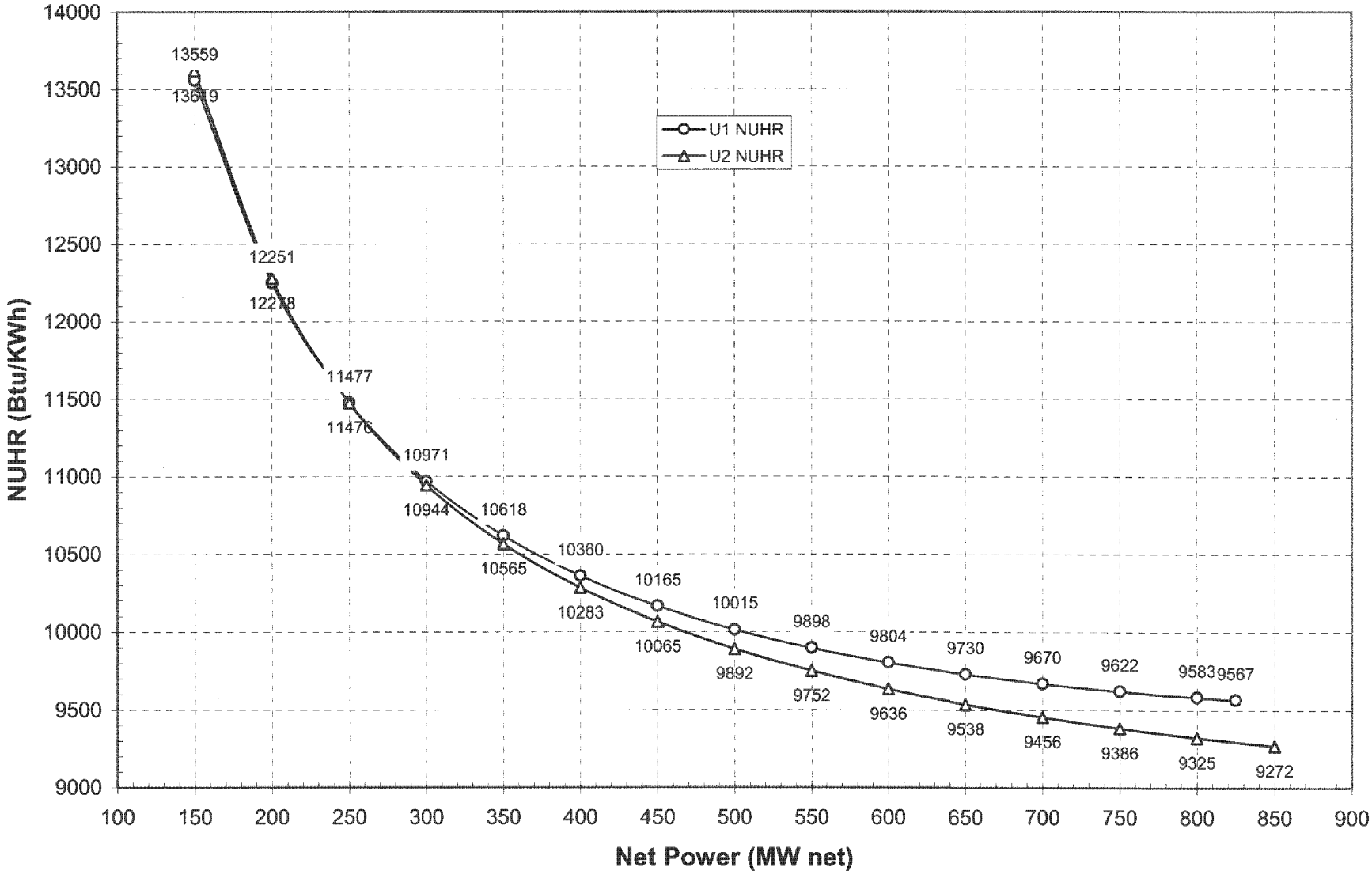


IP7010935

U2 op nuhr.xls 1/8/2003

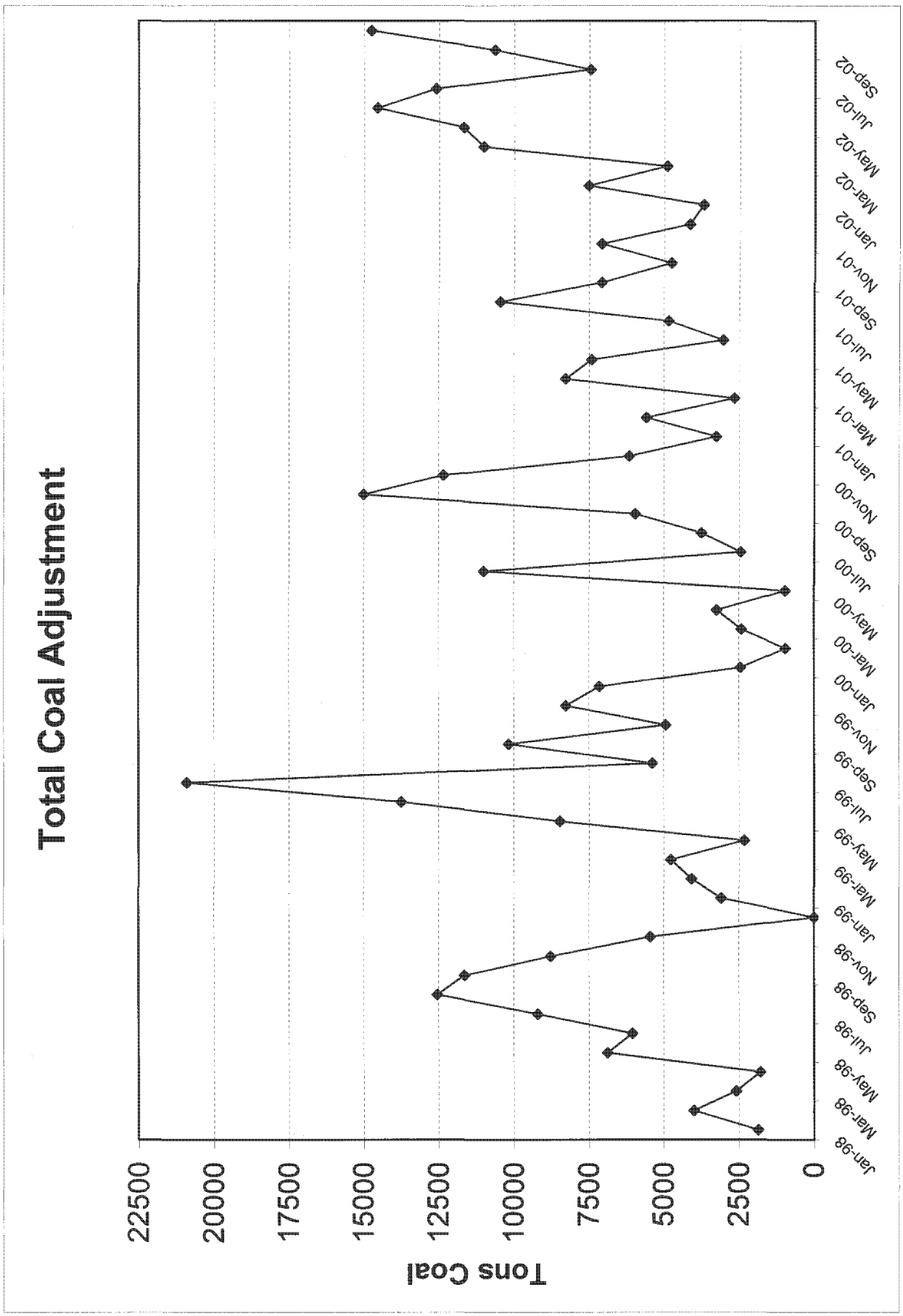
INTERMOUNTAIN GENERATING STATION

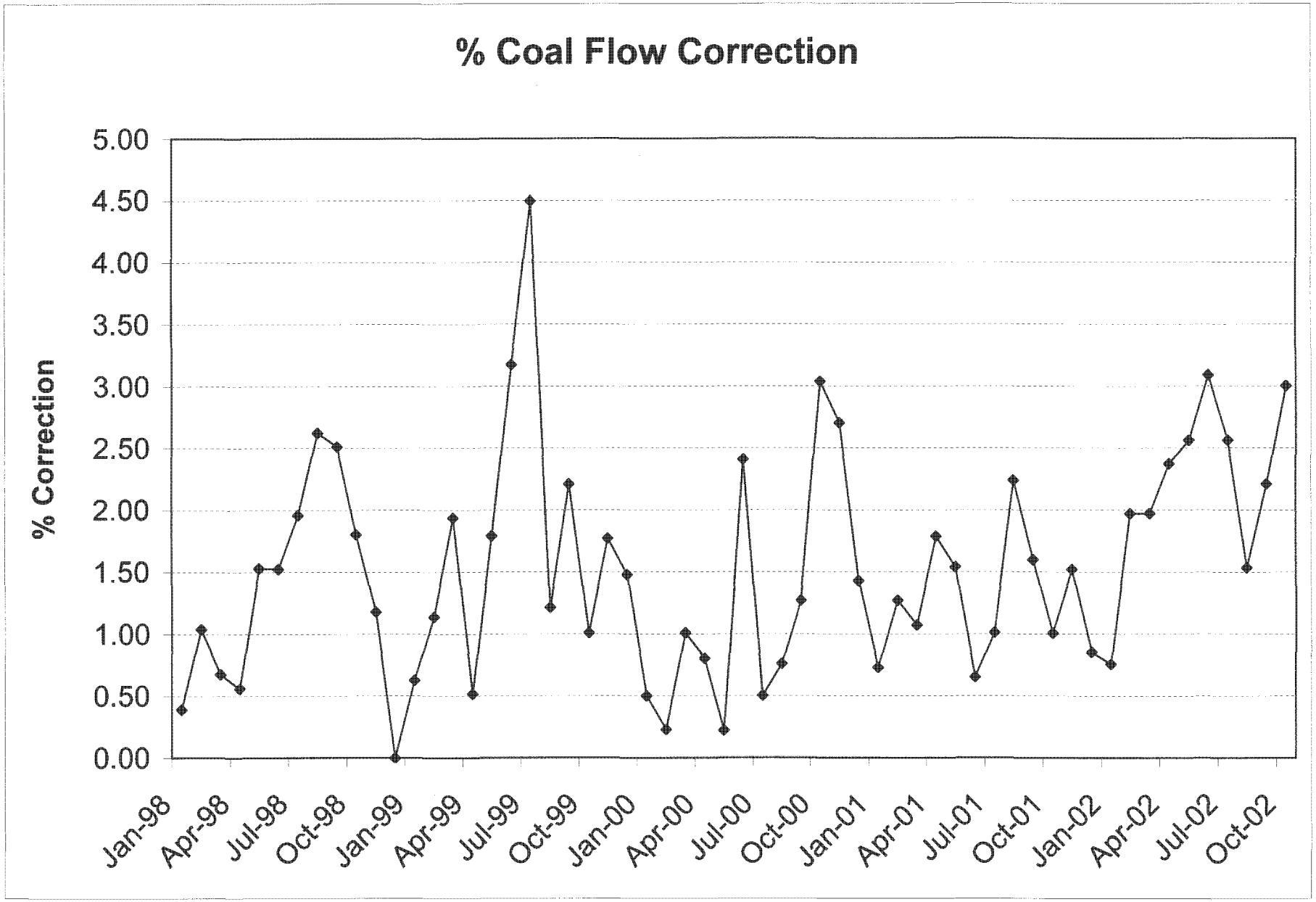
Operating Net Unit Heat Rate Curves - Unit Comparisons



combined.xls 1/8/2003

IP7010936


Total Coal Adjustment
Tons Coal
22500
20000
17500
15000
12500
10000
7500
5000
2500
0
Jan-98
Mar-98
May-98
Jul-98
Sep-98
Nov-98
Jan-99
Mar-99
May-99
Jul-99
Sep-99
Nov-99
Jan-00
Mar-00
May-00
Jul-00
Sep-00
Nov-00
Jan-01
Mar-01
May-01
Jul-01
Sep-01
Nov-01
Jan-02
Mar-02
May-02
Jul-02
Sep-02


% Coal Flow Correction
% Correction
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Jan-98
Apr-98
Jul-98
Oct-98
Jan-99
Apr-99
Jul-99
Oct-99
Jan-00
Apr-00
Jul-00
Oct-00
Jan-01
Apr-01
Jul-01
Oct-01
Jan-02
Apr-02
Jul-02
Oct-02

Coal Feeders % Deviation from average of daily tonnage

Unit 1

2002	Dec-08	Dec-09	Dec-10	Dec-11	Dec-12	Dec-13	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22	Dec-23	Dec-24
A Pulv-MC3	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	-1.7%	-1.8%	-1.6%	-1.6%	-1.6%
B Pulv	2.1%	2.2%	2.1%	2.1%	2.1%	1.7%	2.0%	2.3%	1.8%	2.1%	2.2%	2.2%	2.5%	2.3%	2.5%	2.5%	2.5%
C Pulv-MC3	-0.2%	0.0%	-0.3%	-0.1%	-0.2%	-0.6%	-0.4%	-2.3%	-0.4%	-0.2%	0.1%	0.0%	#VALUE!	#VALUE!	#VALUE!	0.2%	0.2%
D Pulv-MC3	0.8%	1.0%	1.2%	0.9%	0.9%	0.4%	0.7%	1.1%	0.6%	0.8%	1.0%	0.9%	1.3%	1.1%	1.3%	1.1%	1.2%
E Pulv-MC3	-1.0%	-0.9%	-0.6%	-0.9%	-1.0%	#VALUE!	-1.2%	#VALUE!	0.5%	0.3%	-1.7%	-0.9%	-0.7%	-0.8%	-0.6%	-0.7%	-0.7%
F Pulv	-1.1%	-0.9%	-1.3%	-1.0%	-1.1%	#VALUE!	#VALUE!	-0.8%	-1.2%	-1.7%	-0.8%	-1.0%	-0.7%	-0.8%	-1.6%	-0.7%	-0.7%
G Pulv-MC3	-1.0%	-1.0%	-1.1%	-1.0%	-1.2%	-1.6%	-1.3%	-1.0%	-1.4%	-1.2%	-0.9%	-1.1%	-0.8%	#VALUE!	#VALUE!	-0.8%	-0.9%
H Pulv	0.4%	-0.4%	#VALUE!	#VALUE!	0.4%	0.0%	0.2%	0.7%	0.2%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!

U1 calibrations

Unit 2

A Pulv-MC3	#VALUE!	-13.3%	0.0%	-0.3%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.2%	-2.2%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	-0.9%
B Pulv-MC3	0.5%	2.8%	0.8%	0.5%	0.8%	0.8%	1.0%	0.6%	0.1%	1.0%	1.1%	1.1%	0.3%	0.5%	#VALUE!	#VALUE!	0.6%
C Pulv-MC3	-0.2%	2.0%	-0.1%	0.0%	0.1%	0.1%	0.4%	-0.1%	0.0%	0.3%	0.3%	0.2%	-0.2%	-0.2%	#VALUE!	-0.3%	-0.2%
D Pulv-MC3	-0.1%	2.1%	#VALUE!	#VALUE!	#VALUE!	0.2%	0.7%	#VALUE!	#VALUE!	0.6%	0.7%	0.6%	0.8%	0.1%	0.1%	0.2%	0.2%
E Pulv-MC3	1.1%	3.3%	1.1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	1.0%	1.1%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	1.1%	#VALUE!	1.2%	1.3%
F Pulv	-1.0%	1.1%	-1.6%	#VALUE!	-0.8%	-0.9%	-2.2%	-1.0%	-0.9%	-2.0%	-2.6%	#VALUE!	-1.3%	-1.1%	#VALUE!	-1.0%	-1.0%
G Pulv-MC3	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
H Pulv-MC3	-0.3%	2.0%	-0.3%	-0.2%	-0.2%	-0.1%	0.2%	-0.4%	-0.3%	0.1%	0.3%	0.3%	0.4%	-0.3%	-0.1%	-0.1%	-0.1%

U2 calibrations

	1st	2nd	3rd	4th
calibration priority	2F	1A		
WOR#				
Date WOR Entered				
WO#				
Date calibrated				

note: Only compares feeders with the same hours in-service for that day and adjusts for feeder bias.

Coal Feeders % D

Unit 1

2002	Dec-25	Dec-26	Dec-27	Dec-28	Dec-29	Dec-30	Dec-31	Jan-01	Jan-02	Jan-03	Jan-04	Jan-05	Jan-06	Jan-07
A Pulv-MC3	-1.2%	-1.2%	-1.6%	-1.8%	-1.8%	-1.7%	-2.0%	-1.4%	-1.4%	-1.8%	-2.0%	-1.9%	-1.8%	-1.7%
B Pulv	#VALUE!	#VALUE!	2.5%	2.6%	2.5%	2.5%	2.3%	2.8%	2.7%	2.3%	2.4%	2.3%	2.5%	2.7%
C Pulv-MC3	0.5%	0.6%	0.1%	0.0%	0.2%	0.1%	#VALUE!	#VALUE!	#VALUE!	-0.2%	-0.2%	-0.2%	0.0%	0.2%
D Pulv-MC3	1.6%	1.6%	1.2%	1.2%	1.2%	1.3%	1.1%	1.5%	1.4%	1.1%	1.1%	1.1%	1.2%	#VALUE!
E Pulv-MC3	-0.3%	-0.3%	-0.7%	-0.7%	-0.6%	-0.6%	-0.9%	-2.9%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
F Pulv	-0.2%	-0.3%	-0.6%	-0.6%	-0.7%	#VALUE!	#VALUE!	-0.4%	-2.9%	-0.9%	-0.9%	-0.7%	-0.7%	-0.4%
G Pulv-MC3	-0.5%	-0.4%	-0.8%	-0.8%	-0.8%	-1.6%	-1.1%	-0.6%	-0.7%	-1.1%	-1.1%	-1.2%	-0.8%	-0.7%
H Pulv	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.6%	1.1%	1.0%	0.7%	0.7%	0.5%	-0.3%	#VALUE!

U1 calibrations

Unit 2

A Pulv-MC3	2.7%	-0.2%	#VALUE!	-1.9%	-0.2%	-0.2%	#VALUE!	#VALUE!	#VALUE!	#VALUE!	0.1%	#VALUE!	-0.5%	#VALUE!
B Pulv-MC3	3.6%	0.7%	0.4%	#VALUE!	0.6%	#VALUE!	0.8%	2.5%	#VALUE!	0.5%	0.9%	#VALUE!	0.3%	0.5%
C Pulv-MC3	2.8%	0.0%	-0.2%	#VALUE!	-0.1%	#VALUE!	0.5%	1.8%	-0.1%	-0.3%	-1.9%	#VALUE!	-0.4%	-0.2%
D Pulv-MC3	3.0%	0.3%	0.1%	1.2%	0.3%	0.2%	-0.3%	-1.1%	1.1%	0.1%	0.5%	0.1%	-0.1%	0.3%
E Pulv-MC3	4.1%	#VALUE!	1.0%	#VALUE!	1.3%	#VALUE!	-0.9%	-4.4%	0.9%	1.1%	1.6%	#VALUE!	1.0%	0.4%
F Pulv	-18.7%	#VALUE!	-0.8%	#VALUE!	-1.9%	#VALUE!	-0.8%	-0.7%	-0.1%	-1.1%	-1.5%	#VALUE!	#VALUE!	-1.0%
G Pulv-MC3	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
H Pulv-MC3	2.4%	-0.8%	-0.5%	0.6%	-0.1%	#VALUE!	0.6%	1.8%	-1.7%	-0.2%	0.3%	-0.1%	-0.3%	#VALUE!

U2 calibrations

	1st	2nd	3rd	4th
calibration priority				
WOR#				
Date WOR Entered				
WO#				
Date calibrated				

note: Only compares feeders with the same hours in-service for that day and adjusts for feeder bias.

INTERMOUNTAIN GENERATING STATION

2002 ANNUAL COAL INVENTORY DATA SHEET

		Date	Time
Scheduled Fly-over		6/5/2002	10:00-14:00
Actual Fly-over		6/5/2002	13:05
Last Train Delivery #	02-255	6/5/2002	0:40
Last Truck Delivery #	12531	9/10/2001	-

In-Plant Coal Reserve Inventory

			% Full	Tons
Coal Train Unloading Hoppers				
A (east)	1300	tons full	15%	195
B (west)	1300	tons full	15%	195
Coal Truck Unloading Hoppers				
A (east)	130	tons full	0%	0
B (west)	130	tons full	0%	0
Reserve Reclaim Hoppers				
A	50	tons full	100%	50
B	50	tons full	100%	50
Crusher Building Surge Hoppers				
Total	180	tons full	0%	0
In-Plant Surge Hoppers				
Total	160	tons full	0%	0
Active Reclaim Hoppers				
Total	5000	tons full	100%	5,000

Coal Silos	Unit 1 (Tons)	Unit 2 (Tons)
A	462	421
B	590	491
C	702	416
D	599	615
E	309	406
F	351	320
G	330	607
H	746	733
Total	4089	4009

Total In-Plant Reserve Inventory 13,588

Inventory Book Value Calculation

	Truck	Train	Total Tons
Coal Deliveries (01:00 June 1 - 13:05 June 5)	0	46,208	46,208

	Unit 1	Unit 2	Total Tons
Coal Usage (01:00 June 1 - 13:05 June 5)	35,865	35,864	71,729

Start of Month Inventory (IPSC book value 01:00 June 1) 1,035,385

IPSC Coal Inventory Book Value (13:05 June 5) 1,009,864

Comments: flyover witnessed by David Spence, IPSC, and Sean Bryant, IPA

Attachment 2

Printed out for: GARRY-C - 07-Jan-03 14:49:56
100 Messages OPS HRIP2 Unit 2 Operations HRIP 07-Jan-03 14:49:56

Unit 2 MW= 902.3 CREW= 3

	DESCRIPTION	ACTUAL	TARGET	
1	MN STM TEMP	1006.	1000.	DEGF
2	RH STM TEMP	998.	1000.	DEGF
3	TH STM PRESS	2205.	2216.	PSIG
4	EXCESS O2	1.8	3.2	PCT
5	FW TEMP	545.	545.	DEGF
6	CN A BK PRES	3.03	3.39	INHGA
7	CN B BK PRES	2.39	2.82	INHGA
8	CN C BK PRES	2.12	2.35	INHGA
9	RHT SPRY FLOW	7.	0.	KPPH
10	M STM SPR FL	205.	63.	KPPH
11	AUX POWER	44.7	44.5	MW
12	CYCLE MAKEUP	18.	64.	KPPH
13	FURNACE EGT	2341.	2200.	DEGF
14	CONVECT P IGT	1498.	1475.	DEGF
15	RH SIDE EGT	744.	759.	DEGF
16	ECON SIDE EGT	728.	760.	DEGF
17	BLR BLOWDOWN	1.	0.	KPPH
	SOOT BLWR			
	TOTAL TONS/DA	70.		TONS/DAY

LOSSES TONS/DAY SAVINGS

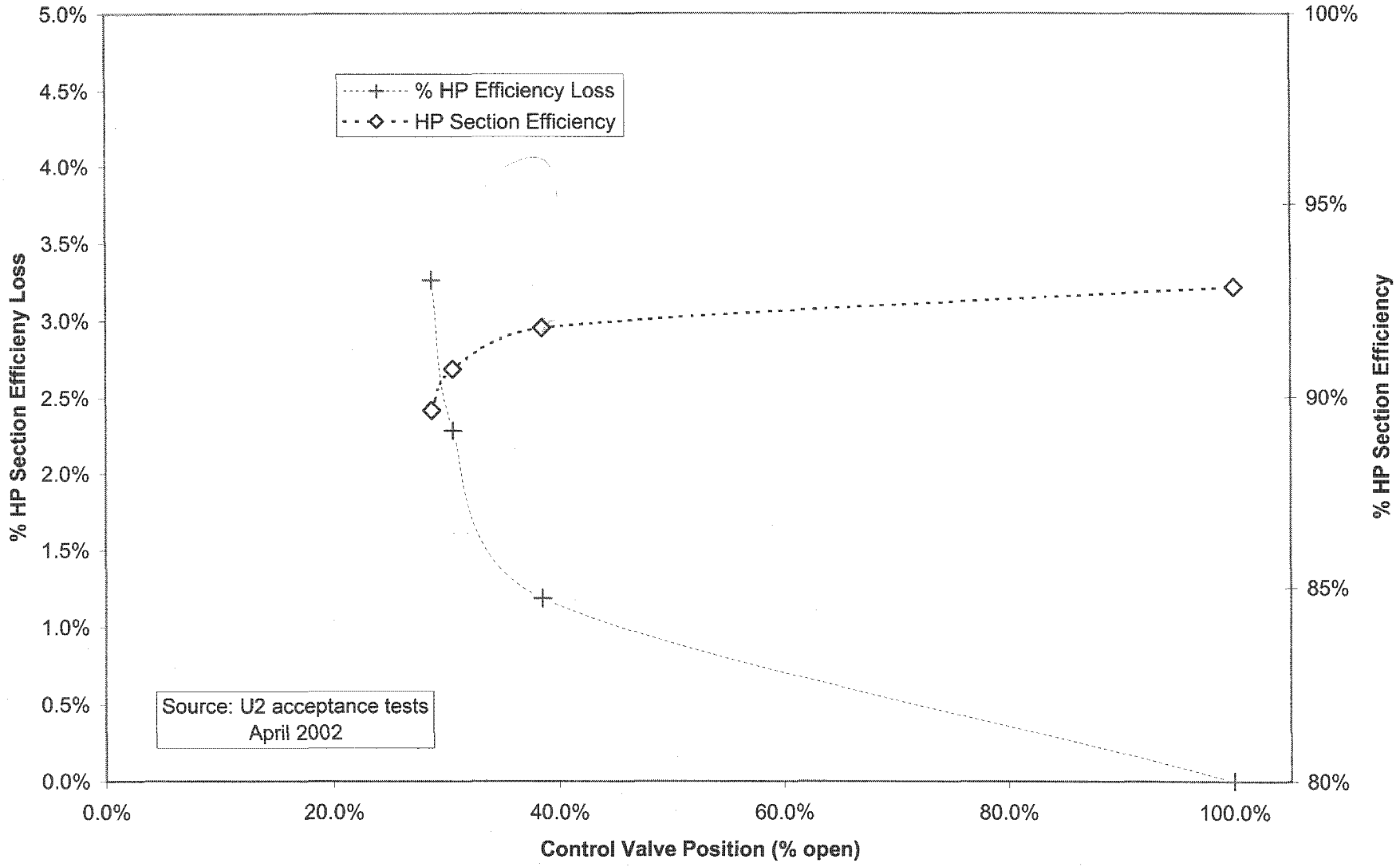
-15 -10 -5 0 5 10 15

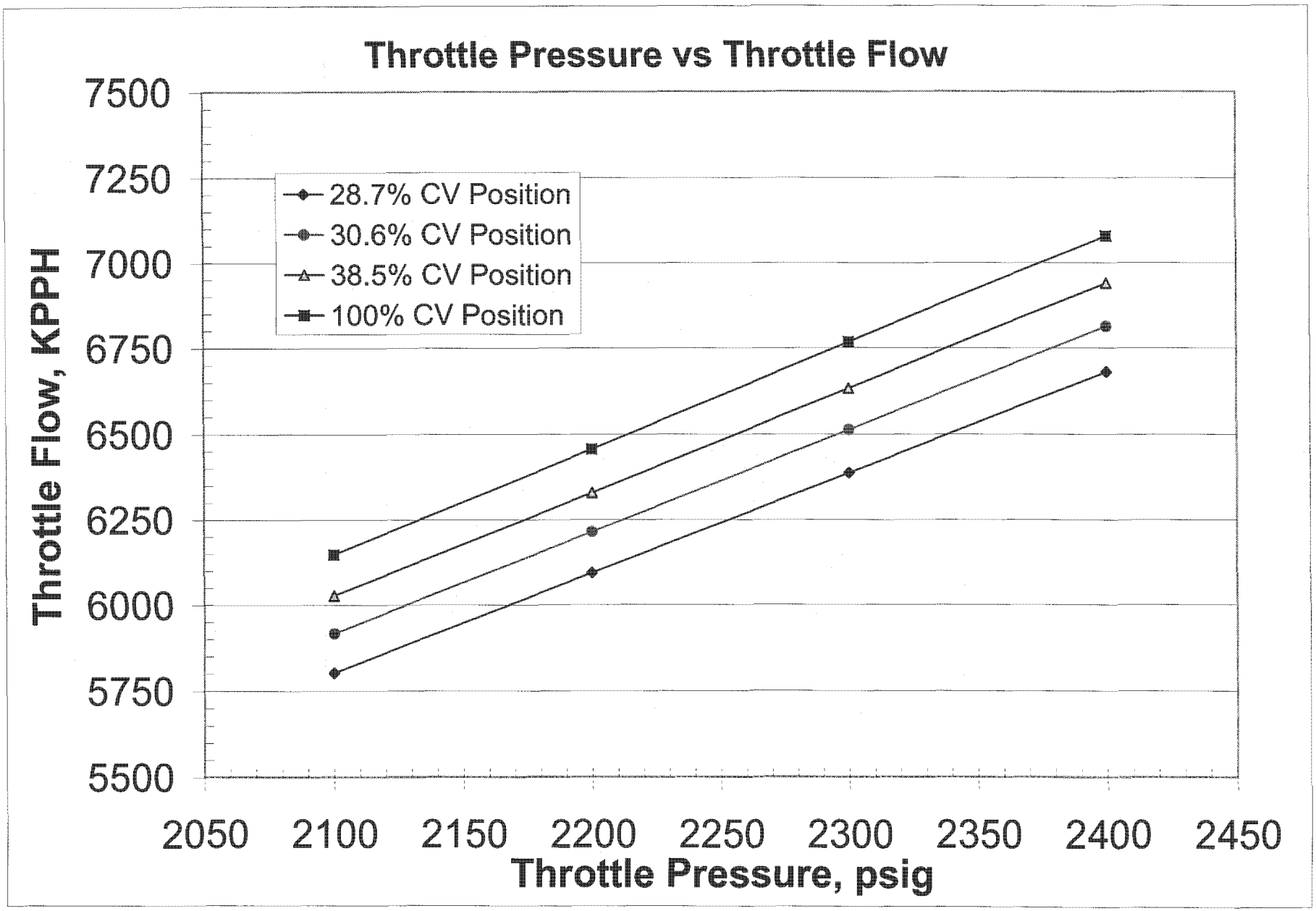
-150 -100 -50 0 50 100 150

EndTim= 07-Jan-03 14:49:56 /EvalTim= 07-Jan-03 14:49:56 /PanRate= 0

IP7010942

Control Valve Position Effects on HP Efficiency




Throttle Pressure vs Throttle Flow
Throttle Flow, KPPH
7500
7250
7000
6750
6500
6250
6000
5750
5500
28.7% CV Position
30.6% CV Position
38.5% CV Position
100% CV Position
2050
2100
2150
2200
2250
2300
2350
2400
2450
Throttle Pressure, psig

IP701094

Intermountain Generating Station

Cost of Cycle Leaks

Source	Load Reduction (KW)	NTCHR Penalty (Btu/kwh)	Fuel Cost ($/month)
Steam (10 kpph to cond)			
Main Steam	346	14.71	$10,588
Hot Reheat	1,279	12.80	$9,214
Cold Reheat	1,264	10.22	$7,356
#8 FW Heaters Ext	1,259	12.22	$8,796
#7 FW Heaters Ext	1,264	10.22	$7,356
#6 FW Heaters Ext	1,122	9.99	$7,191
Dearator Ext	886	7.99	$5,751
#4 FW Heater Ext	717	6.45	$4,643
#3 FW Heater Ext	581	5.23	$3,765
#2 FW Heater Ext	333	2.99	$2,152
#1 FW Heater Ext	151	1.35	$972
FWHTR Drains (10 kpph to cond)			
#8 FW Heaters Drain	275	2.37	$1,706
#7 FW Heaters Drain	166	1.51	$1,087
#6 FW Heaters Drain	123	1.13	$813
Dearator Drain	110	1.01	$727
#4 FW Heater Drain	55	0.49	$353
#3 FW Heater Drain	20	0.18	$130
#2 FW Heater Drain	8	0.07	$50
Cycle Recirculation (10 kpph)			
BFP Recirc to Dearator	6	0.04	$29
BBFP Recirc to Dearator	1	0.01	$7
BFP Recirc to Condenser	142	1.31	$943
BFP Recirc to Conp Pump Disch	108	0.98	$705
Boiler Losses (10 kpph to drains) * includes cond make-up costs			
Drum Blowdown	331	5.97	$4,945
Drum Steam	331	8.94	$7,083
SSH Platen Outlet Header	331	11.68	$9,055
Secondary Superheat Outlet	331	13.85	$10,617

Created 11/96 by DS
-Calculates the cost of cycle losses based on 10 kpph leakage. Cost Calc calculates the dollar value based on fuel cost and net capacity factor. These values can be changed and fuel cost will automically update. Note that there is a correction from NTCHR to NSHR.
-NTCHR's calculated using pepse loss2.mdl with boundries at turbine control valves and economizer inlet. Load effects calculated at constant control valve opening. This is the reason why main steam and ss steam load effects are so low.
- Note that losses to drains includes the make-up cost of $647/month per 10kpph make-up.

Matrix of Feedwater Heater Performance Problems

	Bypassing Between Passes in Channel	Inadeqate Venting	Reduced Heat Transfer Caused By Shell Side Fouling	High Water Level (Caused By Leak in DC Zone Shroud)	Small Leak in Desuperheating Zone Shroud	Leak in Subcooling Zone	Water Side Fouling	Large Condensing Zone or Desuperheater Zone[1] Leak	Leak in Higher Pressure Heater Cascading to This Heater	Steam Entrainment in Drain Cooler Zone
High TTD	X	X	X	X	X		X			
Normal TTD									X	X
Low TTD										
High DCA							X		X	X
Normal DCA		X[1]	X[1]	X[1]	X[1]					
Low DCA		X[1]	X[1]	X[1]	X[1]	X				
High Feedwater ΔP							X[2]			
Low Feedwater ΔP	X									
Normal ΔP		X	X	X	X					

[1] Either condition can exist

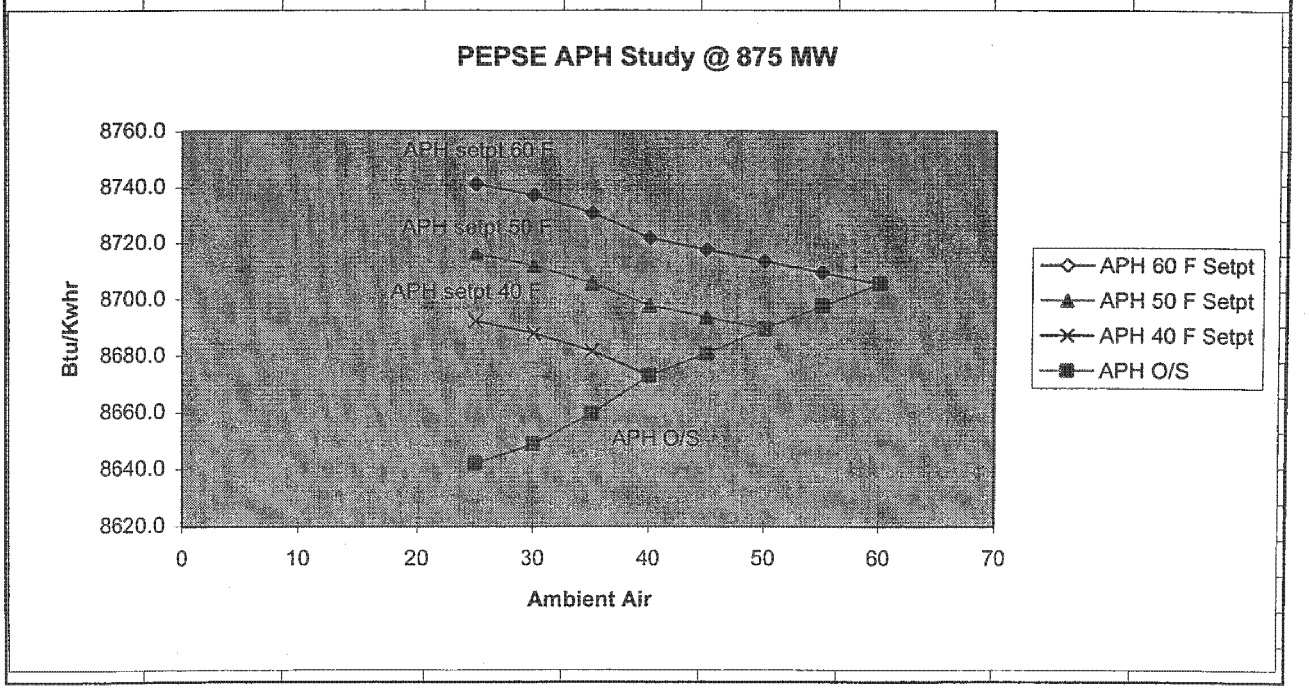
[2] Does not necessarily occur if this problem exists

(Source: Heat Exchanger Systems, Inc, Feedwater Heater Operation, Maintenance, And Performance Seminar, 6-53)

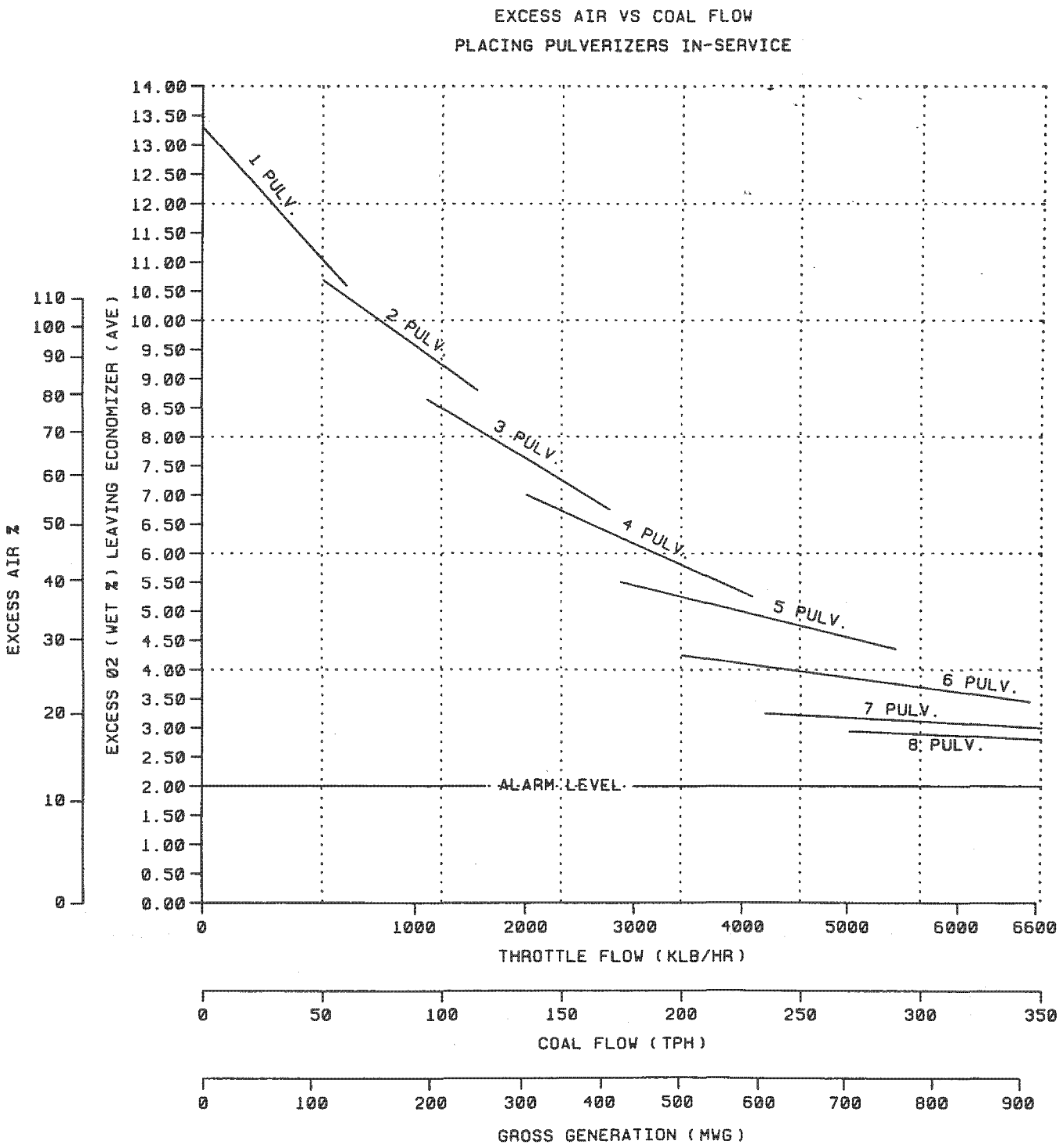
IP70109 46

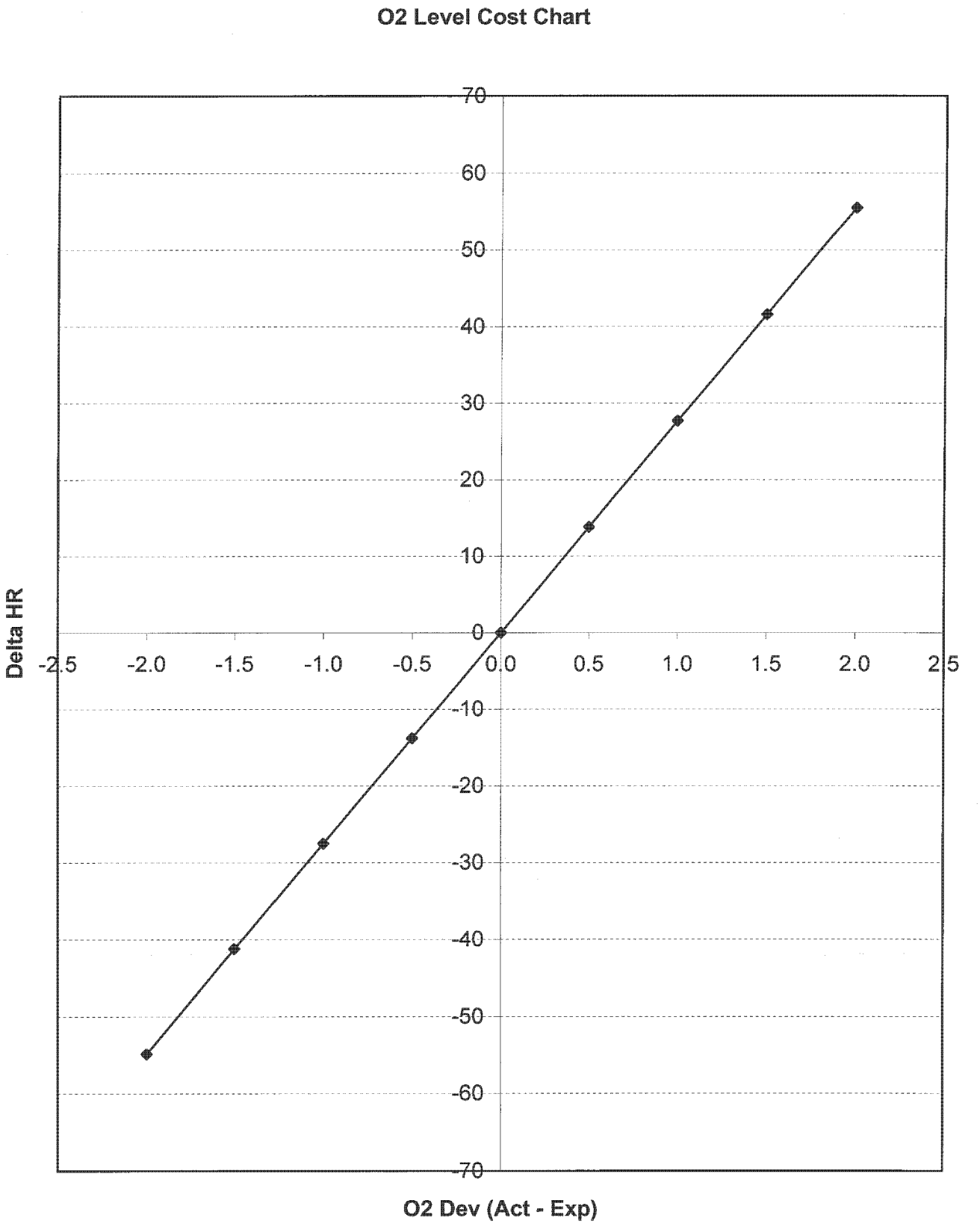
	Ambient Air	APH setpt	Blr Eff (HL)	NTCHR	CEAT	NTCHR/Blr Eff		
	25	60	88.04	7695.8	178.75	8741.3		
	30	60	88.04	7692.2	178.70	8737.2		
	35	60	88.04	7686.6	178.70	8730.8		
	40	60	88.05	7679.7	178.60	8722.0		
	45	60	88.05	7676.0	178.60	8717.8		
	50	60	88.05	7672.4	178.55	8713.7		
	55	60	88.05	7668.8	178.55	8709.6		
	60	60	88.05	7665.2	178.50	8705.5		
								Savings @
	Ambient Air	APH setpt	Blr Eff (HL)	NTCHR	CEAT	NTCHR/Blr Eff		50 instead 60
	25	50	88.21	7688.6	169.40	8716.2		25.0
	30	50	88.21	7684.9	169.35	8712.1		25.1
	35	50	88.21	7679.4	169.30	8705.8		25.0
	40	50	88.21	7672.5	169.25	8698.0		24.0
	45	50	88.21	7668.9	169.20	8693.9		23.9
	50	50	88.21	7665.2	169.20	8689.7		24.0
								Savings @
	Ambient Air	APH setpt	Blr Eff (HL)	NTCHR	CEAT	NTCHR/Blr Eff		40 instead 60
	25	40	88.37	7681.4	159.95	8692.3		48.9
	30	40	88.37	7677.7	159.95	8688.1		49.0
	35	40	88.37	7672.2	159.90	8681.9		48.9
	40	40	88.38	7665.3	159.85	8673.1		48.9
	Ambient Air	APH setpt	Blr Eff (HL)	NTCHR	CEAT	NTCHR/Blr Eff		
	25	no APH	88.70	7665.5	143.45	8642.1		
	30	no APH	88.63	7665.4	147.20	8648.8		
	35	no APH	88.52	7665.4	152.20	8659.5		
	40	no APH	88.38	7665.3	159.85	8673.1		
	45	no APH	88.30	7665.3	164.55	8681.0		
	50	no APH	88.21	7665.2	169.20	8689.7		
	55	no APH	88.13	7665.2	173.85	8697.6		
	60	no APH	88.05	7665.2	178.50	8705.5		

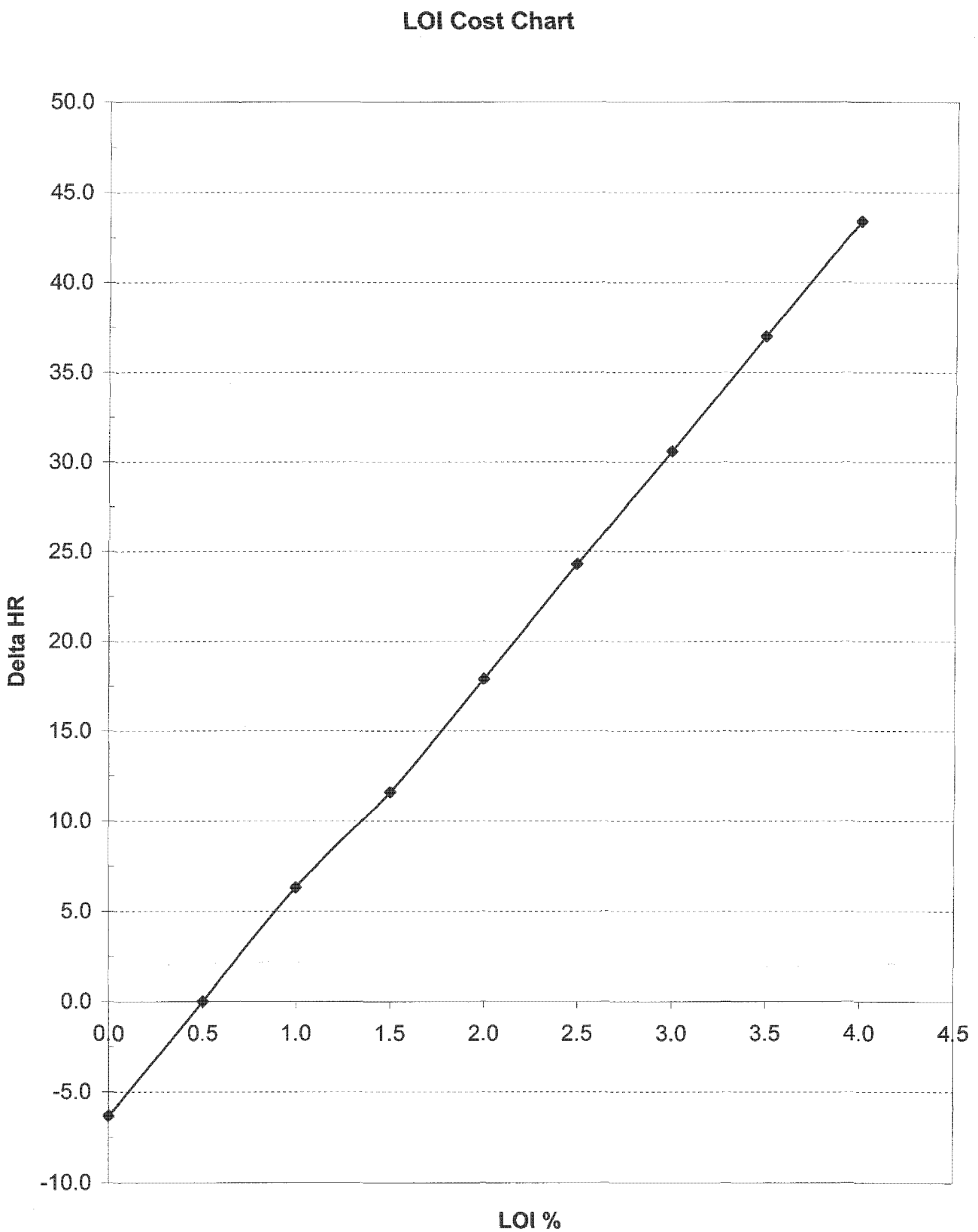
PEPSE special option 11 APH study at setpoint of 875 MW. Models: Combined.mdl & Blr11.mdl

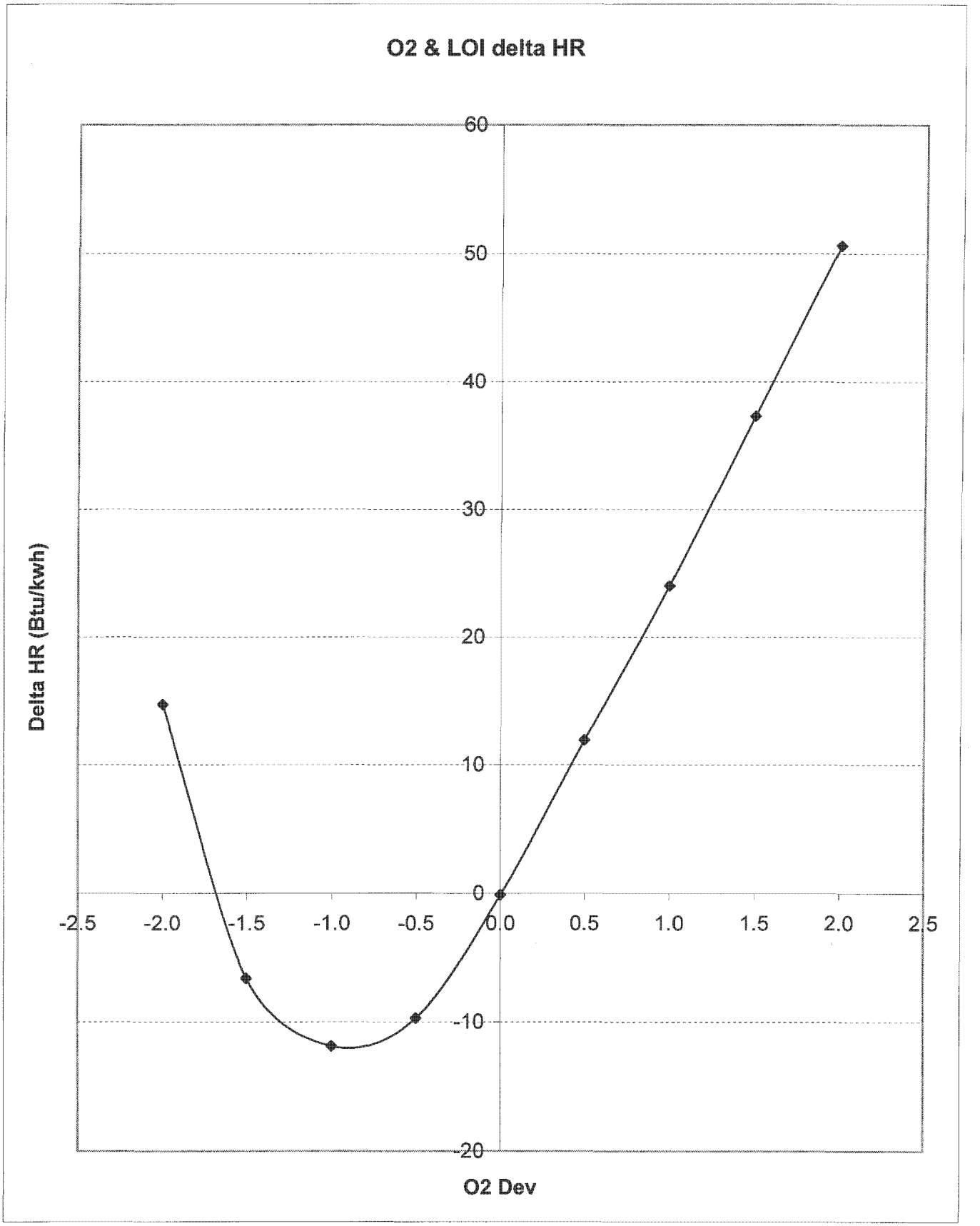


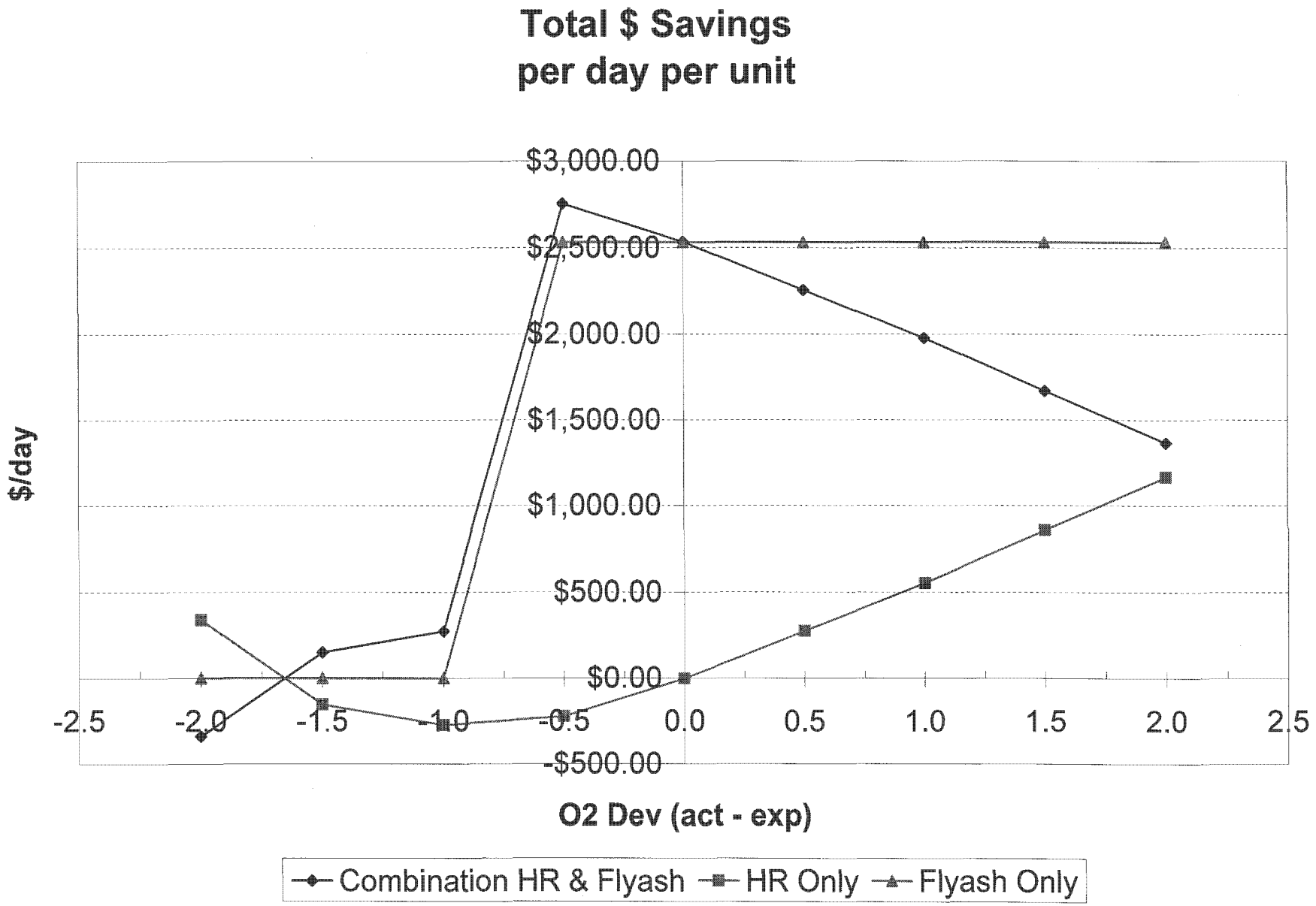
INTERMOUNTAIN GENERATING STATION




O2 Level Cost Chart
Delta HR
70
60
50
40
30
20
10
0
-10
-20
-30
-40
-50
-60
-70
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
O2 Dev (Act - Exp)


LOI Cost Chart
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
-5.0
-10.0
Delta HR
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
LOI %


O2 & LOI delta HR
Delta HR (Btu/kwh)
60
50
40
30
20
10
0
-10
-20
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
O2 Dev


Total $ Savings
per day per unit
$3,000.00
$2,500.00
$2,000.00
$1,500.00
$1,000.00
$500.00
$0.00
-$500.00
$/day
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
O2 Dev (act - exp)
Combination HR & Flyash
HR Only
Flyash Only

IP7010952

ISG RESOURCES INC. DATE 1/6/03 Delta UT.

Unit # 1 Baghouse Testing Report **Unit # 2**

Date Sampled 1/6/03
Baghouse Status AA
Time Sampled 7:10 Am

Testing Results

	LOI	AEA	COLOR
East	2.18	30	4/1
West	1.89	27	5/1
Avg.	2.03		

Ash Saved 0
Comments

Date Sampled 1/6/03
Baghouse Status BA
Time Sampled 7:10 Am

Testing Results

	LOI	AEA	COLOR
East	.78	10	6/2
West	.96	12	6/2
Avg.	.87		

Ash Saved East and west 6 Rows
Comments

Date Sampled 1/6/03
Baghouse Status A A
Time Sampled 1:30

Testing Results

	LOI	AEA	COLOR
East	1.96	22	5/1
West	1.73	20	5/1
Avg.	1.84		

Ash Saved 0
Comments

Date Sampled 1-6-03
Baghouse Status B B
Time Sampled 1:30

Testing Results

	LOI	AEA	COLOR
East	.87	10	6/2
West	.76	10	6/2
Avg.	.79		

Ash Saved 6 Rows
Comments

Date sampled 1-6-03
Baghouse Status AA
Time Sampled 4:30pm

Testing Results

	LOI	AEA	COLOR
East	1.66	22	5/1
West	1.82	23	5/1
Avg.	1.74		

Ash Saved 6
Comments

Date sampled 1-6-03
Baghouse Status B B
Time Sampled

Testing Results

	LOI	AEA	COLOR
East	.93	9	6/2
West	1.48	20	5/2
Avg.	1.21		

Ash Saved East
Comments

Date Sampled 1-6-03
Baghouse Status AA
Time Sampled 10pm

Testing Results

	LOI	AEA	COLOR
East	1.75	18	5/2
West	1.70	17	5/2
Avg.	1.73		

Ash Saved 6
Comments

Date Sampled 1-6-03
Baghouse Status B A
Time Sampled 10pm

Testing Results

	LOI	AEA	COLOR
East	.82	8	6/2
West	1.63	20	5/2
Avg.	1.23		

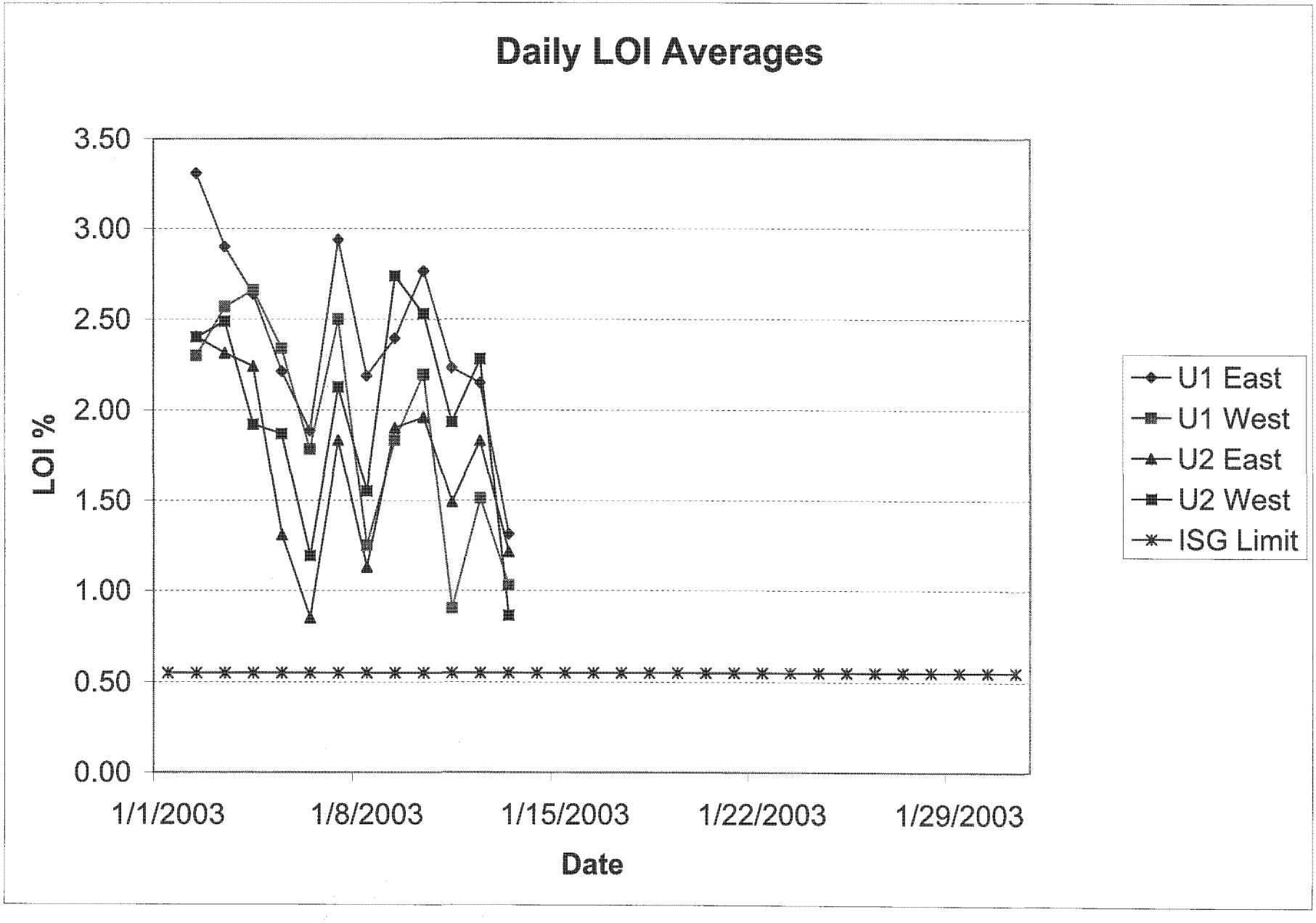
Ash Saved East
Comments

IP7010953

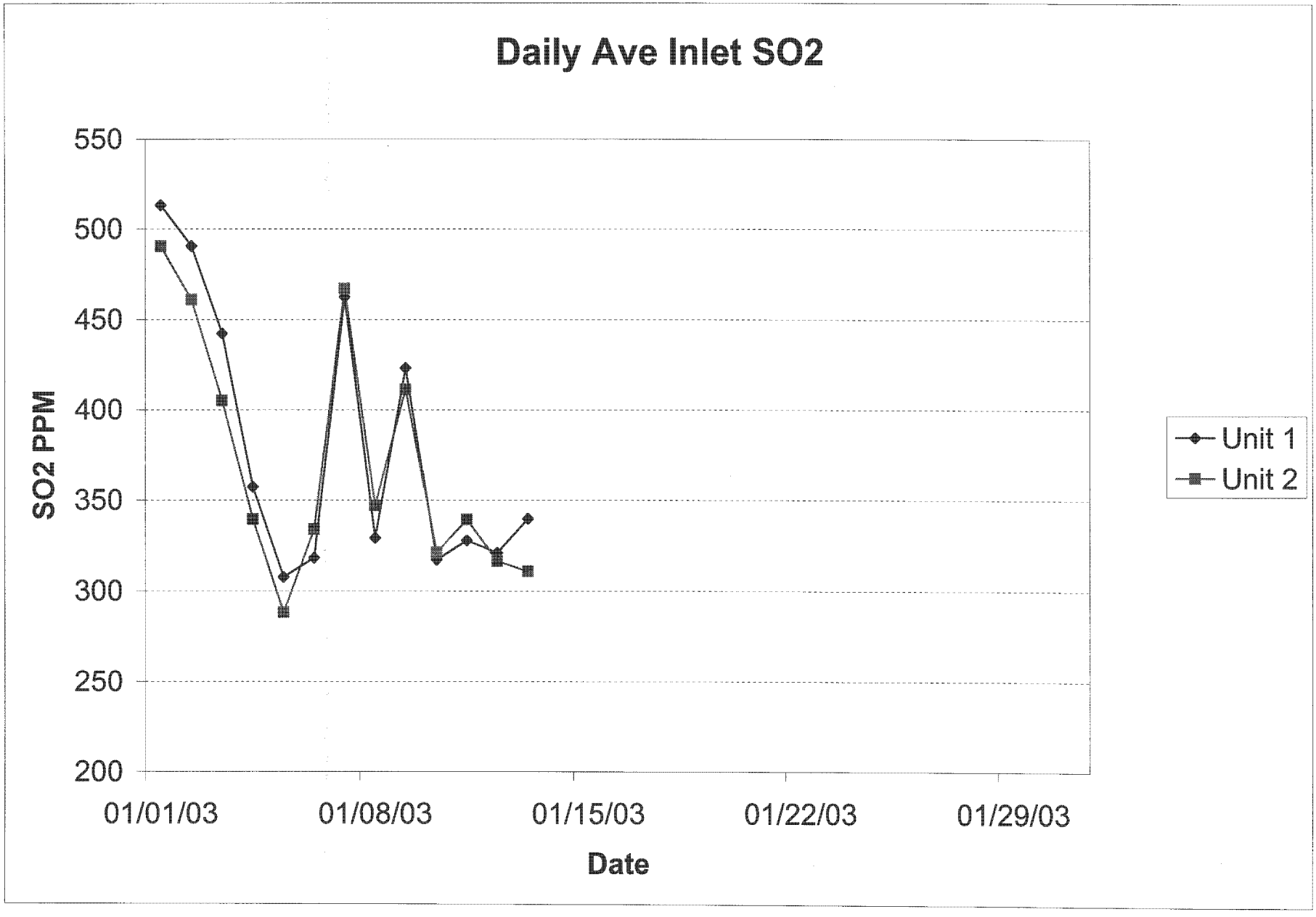
January 2003 Flyash LOI Monthly Summary

2002		Unit 1 East	Unit 1 West	Approx tons Saved	Unit 2 East	Unit 2 West	Approx tons Saved	Total Tons	Unit 1 Foam East	Unit 1 Foam West	Unit 2 Foam East	Unit 2 Foam West	O/S Pulverizer Unit 1	O/S Pulverizer Unit 2	Train Schedule		
1-Jan	AM							0					C	A,G		1-Jan	1/1/2003 4:30
	AM							0					C	A,G			1/1/2003 10:00
	PM							0					C	G			1/1/2003 16:00
	PM							0					C,E	G			1/1/2003 22:00
2-Jan	AM	3.62	2.00	0	2.26	1.80	0	0	35	23	25	22	E	G	Genwal	2-Jan	1/2/2003 4:30
	AM	3.51	2.04	0	2.52	2.14	0	0	35	22	29	24	E	G	Coastal		1/2/2003 10:00
	PM	3.26	2.61	0	2.50	2.89	0	0	30	28	28	30	E	G			1/2/2003 16:00
	PM	2.84	2.55	0	2.34	2.78	0	0	30	26	26	30	E	A,G			1/2/2003 22:00
3-Jan	AM	3.26	2.40	0	1.98	2.46	0	0	40	29	26	30	E	A,G	Westridge	3-Jan	1/3/2003 4:30
	AM	3.01	2.34	0	1.96	2.32	0	0	40	27	26	29	E	G	Coastal		1/3/2003 10:00
	PM	2.93	2.74	0	2.46	2.60	0	0	30	30	30	30	E	G			1/3/2003 16:00
	PM	2.41	2.80	0	2.86	2.58	0	0	28	30	30	30	E	G			1/3/2003 22:00
4-Jan	AM	2.87	2.92	0	2.67	2.40	0	0	28	30	30	30	E	G	Coastal	4-Jan	1/4/2003 4:30
	AM	2.41	2.64	0	2.91	2.73	0	0	22	27	30	30	E	G			1/4/2003 10:00
	PM	2.86	2.72	0	1.68	1.32	0	0	28	24	16	14	E	G			1/4/2003 16:00
	PM	2.42	2.36	0	1.71	1.24	0	0	26	26	16	14	E	G			1/4/2003 22:00
5-Jan	AM	2.47	2.28	0	1.96	1.73	0	0	27	25	20	18	E	A,G		5-Jan	1/5/2003 4:30
	AM	1.96	2.40	0	1.49	1.55	0	0	22	20	18	18	E	G			1/5/2003 10:00
	PM				0.92	2.30	55	55			10	25	E	G			1/5/2003 16:00
	PM				0.86	1.90	55	55			9	20	E	G			1/5/2003 22:00
6-Jan	AM	2.18	1.89	0	0.78	0.96	110	110	30	27	10	12	E	G	Westridge	6-Jan	1/6/2003 4:30
	AM	1.96	1.73	0	0.87	0.70	110	110	22	20	10	10	E	G	Coastal		1/6/2003 10:00
	PM	1.66	1.82	0	0.93	1.48	55	55	22	23	9	20	E	G			1/6/2003 16:00
	PM	1.75	1.70	0	0.82	1.63	55	55	18	17	8	20	E	G			1/6/2003 22:00
7-Jan	AM	2.94	2.50	0	1.54	1.80	55	55	30	27	13	20	E	A,G	Coastal	7-Jan	1/7/2003 4:30
	AM				1.68	1.97	55	55			15	22	D,E	G	Andalex		1/7/2003 10:00
	PM				1.96	2.34	0	0			18	26	E	G			1/7/2003 16:00
	PM				2.16	2.41	0	0			21	26	E	G			1/7/2003 22:00
8-Jan	AM	2.28	1.24	55	1.06	1.56	110	165	28	14	12	18	D	E,G	Arch	8-Jan	1/8/2003 4:30
	AM	2.10	1.26	55	1.10	1.44	110	165	26	14	12	17	A,C,D	A,D,G	Coastal		1/8/2003 10:00
	PM							0					OFFLINE	G			1/8/2003 16:00
	PM				1.23	1.66	110	110			12	17	OFFLINE	G			1/8/2003 22:00
9-Jan	AM	3.02	2.64	0	2.27	2.86	0	0	30	25	22	28	D	G	Westridge	9-Jan	1/9/2003 4:30
	AM				2.78	3.38	0	0			25	30	D	G	Coastal		1/9/2003 10:00
	PM	2.23	1.34	110	1.42	2.46	55	165	21	15	13	30	D	G			1/9/2003 16:00
	PM	1.94	1.52	110	1.14	2.26	55	165	19	16	11	28	D				1/9/2003 22:00
10-Jan	AM	3.00	2.44	0	2.26	3.36	0	0	31	26	26	30	D	D,F	Arch	10-Jan	1/10/2003 4:30
	AM	3.10	2.86	0	2.30	3.40	0	0	30	28	27	30	D	D	Coastal		1/10/2003 10:00
	PM	2.23	1.86	55	1.70	1.92	110	165	18	16	15	17	D	D			1/10/2003 16:00
	PM	2.74	1.63	55	1.58	1.44	110	165	24	16	15	14	D	D			1/10/2003 22:00
11-Jan	AM	2.20	0.70	55	1.46	1.80	110	165	26	10	15	18	D	D,F	Coastal	11-Jan	1/11/2003 4:30
	AM	2.12	0.72	55	1.81	2.07	55	110	24	10	17	21	D	D			1/11/2003 10:00
	PM	2.32	1.14	55	1.72	2.00	55	110	26	13	17	20	D	D			1/11/2003 16:00
	PM	2.30	1.05	55	0.98	1.87	55	110	24	12	11	16	D	D			1/11/2003 22:00
12-Jan	AM	2.50	2.00	0	2.06	3.20	0	0	29	24	26	30	D	A,D		12-Jan	1/12/2003 4:30
	AM	2.31	1.92	0	1.89	2.46	0	0	28	20	19	26	D	D			1/12/2003 10:00
	PM	1.84	0.92	55	1.68	1.79	0	55	27	13	20	25	D	D			1/12/2003 16:00
	PM	1.96	1.21	55	1.70	1.68	0	55	29	15	20	24	D	D			1/12/2003 22:00
13-Jan	AM	1.98	1.82	55	1.38	1.22	110	165	19	15	12	11	D	A,D	Coastal	13-Jan	1/13/2003 4:30
	AM	1.62	0.76	55	1.36	0.60	110	165	15	8	12	8	D	D	Coastal		1/13/2003 10:00
	PM	0.88	0.82	110	1.11	0.76	110	220	9	8	10	8	D	D			1/13/2003 16:00
	PM	0.77	0.72	110	1.01	0.87	110	220	8	8	10	8	D	D			1/13/2003 22:00
14-Jan	AM							0							Andalex	14-Jan	1/14/2003 4:30
	AM							0							Westridge		1/14/2003 10:00
	PM							0									1/14/2003 16:00
	PM							0									1/14/2003 22:00
15-Jan	AM							0							Arch	15-Jan	1/15/2003 4:30
	AM							0							Coastal		1/15/2003 10:00
	PM							0									1/15/2003 16:00
	PM							0									1/15/2003 22:00
16-Jan	AM							0							Arch	16-Jan	1/16/2003 4:30
	AM							0							Coastal		1/16/2003 10:00
	PM							0									1/16/2003 16:00
	PM							0									1/16/2003 22:00

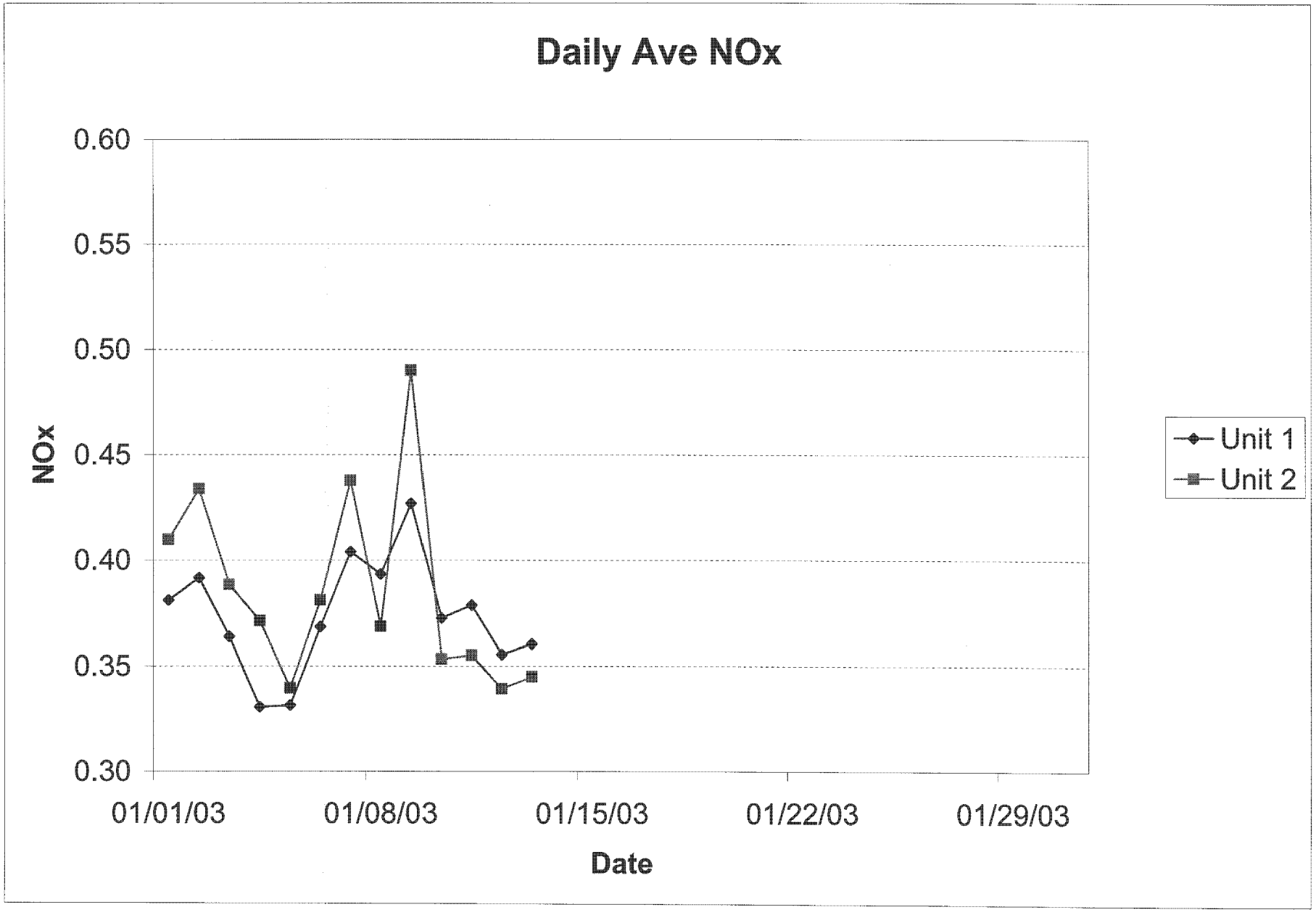
IP7010954


Daily LOI Averages
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
LOI %
1/1/2003
1/8/2003
1/15/2003
1/22/2003
1/29/2003
Date
U1 East
U1 West
U2 East
U2 West
ISG Limit

IP7010955


Daily Ave Inlet SO2
550
500
450
400
350
300
250
200
SO2 PPM
01/01/03
01/08/03
01/15/03
01/22/03
01/29/03
Date
Unit 1
Unit 2

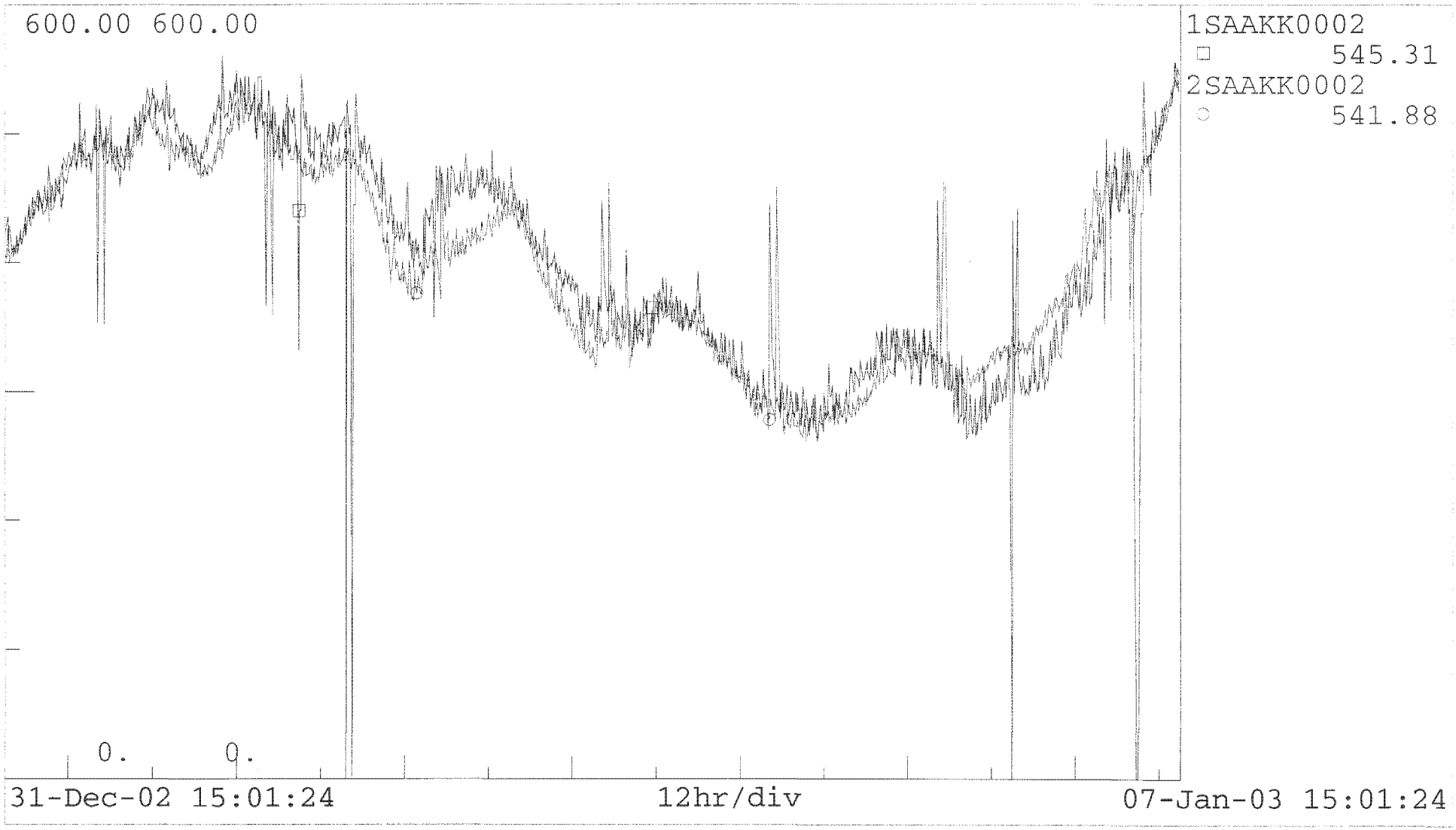
IP7010956


Daily Ave NOx
0.60
0.55
0.50
0.45
0.40
0.35
0.30
NOx
01/01/03
01/08/03
01/15/03
01/22/03
01/29/03
Date
Unit 1
Unit 2

IP7010957

Printed out for: GARRY-C - 07-Jan-03 14:51:50

100 Messages OP ENVIR NOx/SO2 Targets 07-Jan-03 14:51:50



EndTim= 07-Jan-03 14:51:49 /EvalTim= 07-Jan-03 14:51:49 /PanRate= 0

IP7010958

Printed out for: GARRY-C - 08-Jan-03 10:27:01

100 Messages 2SGAclean U2 BOILER SOOTBLOWING CLEANLINESS 08-Jan-03 10:27:01

Fouled: <.7 Dirty: 0.7-0.80 Clean: >.80

Cleanliness Factors:		0.0 .7 .8
WATERWALLS	0.82	
SUPERHEATER		
SH Primary Bank	0.72	
SSH Platen Bank	0.83	
SSH Intrmed Bank	0.78	
SSH Outlet Bank	0.74	
REHEATER		
RH Primary Bank	0.80	
RH Outlet Banks	0.77	
ECONOMIZER	0.67	

Key Parameters:	CCS	PMAX
Main Stm Temp (DegF)	1007.	
Main Stm Spry (KPPH)	230.	228.
RH Stm Temp (DegF)	1002.	
RH Stm Spry (KPPH)	9.	0.
Fuel Flow (TPH)	355.	
Coal Flow (TPH)	355.	328.
Air Flow (%)	76.	
	EAST	WEST
Secondary Air Flow (%)	68.3	70.1
O2 (%)	2.5	1.8
Air Htr Gas In Tmp (DegF	774.	783.

SB TARGET GAS TEMPS

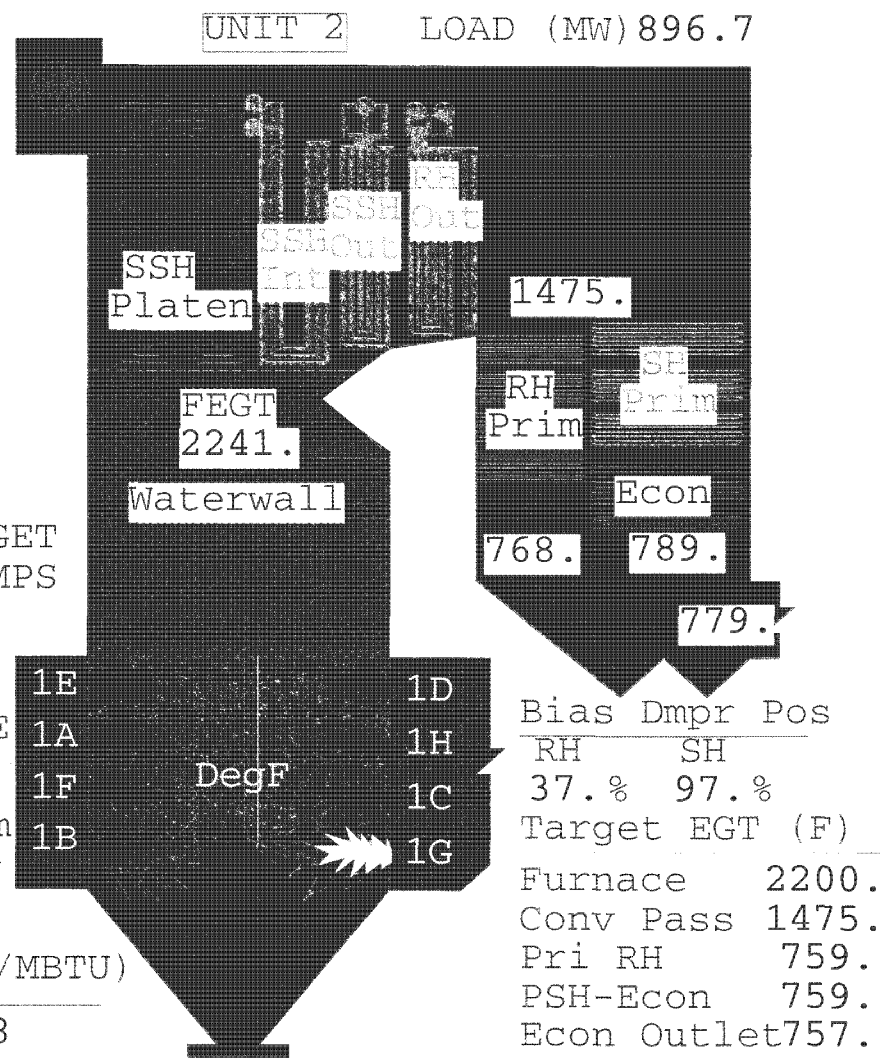
DRAFT PROFILE

O2 Trim

31.5

NOx(#/MBTU)

0.38



Bias Dmpr Pos

RH	SH
37.%	97.%

Target EGT (F)

Furnace	2200.
Conv Pass	1475.
Pri RH	759.
PSH-Econ	759.
Econ Outlet	757.

EndTim= 08-Jan-03 10:27:01 /EvalTim= 06-Jan-03 10:00:00 /PanRate= 0

IP7010959

Dec-02 coal sampled October 2002

Weighted Totals

Mine	sampled Total Tonnage	% of Total	% Na2O	HGI	Softening Temp	HHVC Btu/lb	% H20	% Ash	% Volatile	% Fixed Carbon	% Sulfur
Genwall Resources	8,836.03	1.79	1.89	44.8	2,128	12,300	8.45	7.81	36.46	47.28	0.54
Skyline (Product B) trucks	0.00	0.00	0.97	43.7	2,137	12,562	5.51	6.51	43.20	44.78	0.40
SUFCO (Product A)	195,781.25	39.73	2.76	44.2	2,157	11,140	10.42	9.30	34.46	45.82	0.39
Andalex AMQ	37,495.71	7.61	1.92	42.7	2,131	12,461	7.73	7.69	35.44	49.14	0.66
Andalex	27,987.16	5.68	0.68	42.3	2,345	11,817	7.12	9.69	33.89	49.30	0.50
West Ridge Resources	63,591.28	12.91	1.02	43.4	2,202	12,964	6.06	6.28	34.46	53.20	1.14
West Ridge Resources spc	47,071.66	9.55	1.13	44.1	2,196	12,942	6.28	6.28	34.64	52.80	1.07
Coastal-Dugout	46,451.20	9.43	0.66	41.1	2,378	11,732	6.84	11.95	33.46	47.74	0.72
Arch-Dugout (product B)	65,515.00	13.30	0.69	41.0	2,354	11,855	6.41	11.02	34.43	48.14	0.73
Arch (spot)	0.00	0.00	0.85	44.4	2,307	11,542	6.25	13.13	33.27	47.35	0.57
Totals	492,729.29	100.00	1.71	43.16	2,222	11,858	8.16	8.97	34.46	48.41	0.66

INTERMOUNTAIN POWER SERVICE CORPORATION
FUELS LABORATORY
ULTIMATE ANALYSIS

Lab Number: 30570 TRAIN No.

Identification: WEST RIDGE 02-211

Date Sampled: 5/9/02

<<<<< DATA TABLE >>>>>

ANALYSIS	AS RECEIVED	DRY BASIS
% Total Moisture	5.82	
% Carbon	70.83	75.21
% Hydrogen	5.01	5.32
% Nitrogen	1.69	1.79
% Ash	7.55	8.02
% Sulfur	1.36	1.44
% Oxygen (by difference)	7.74 /	8.22 /

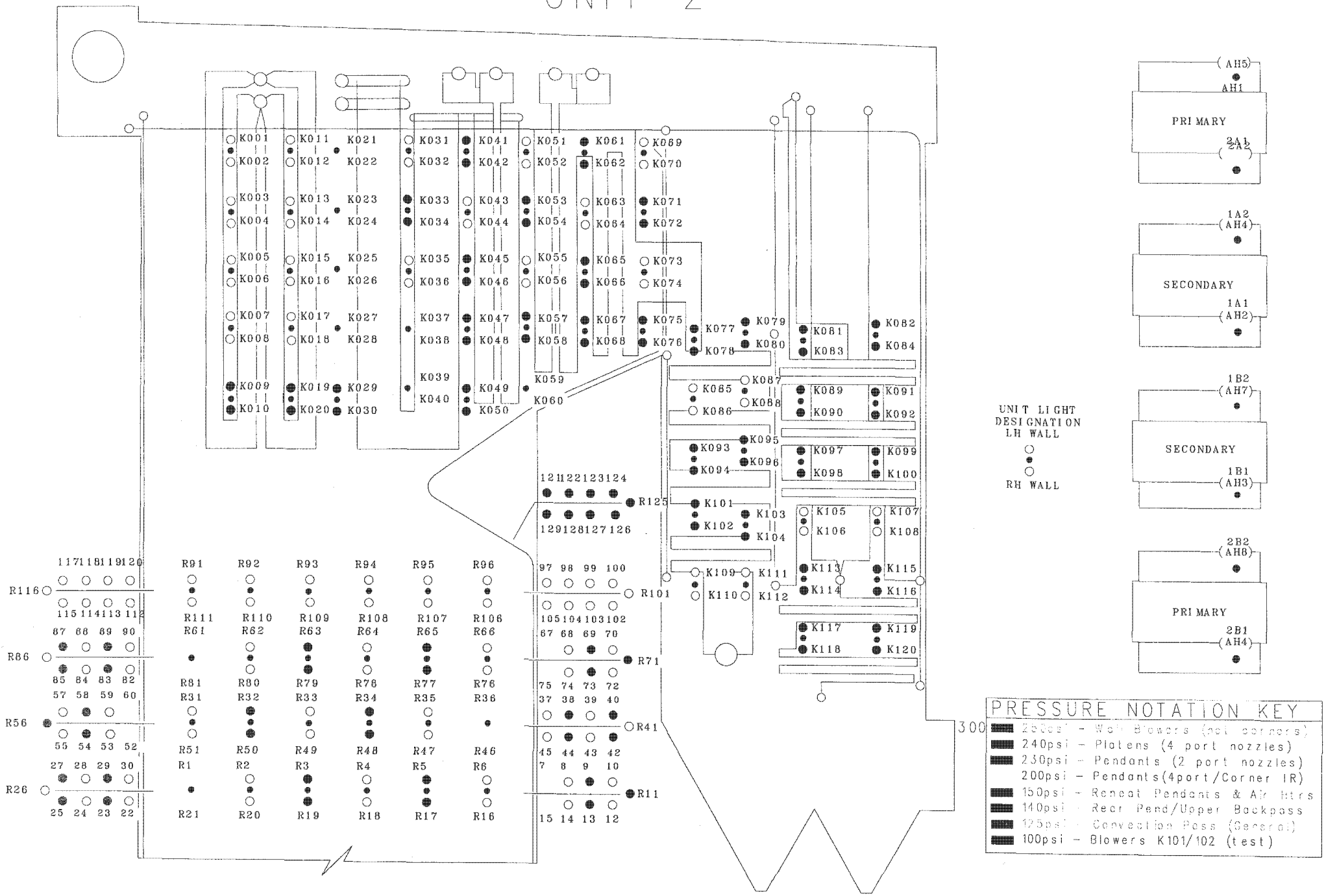
13684d
13706

NOTE: (As Received Basis)

Hydrogen and Oxygen DO NOT Include H and Ox in sample moisture.

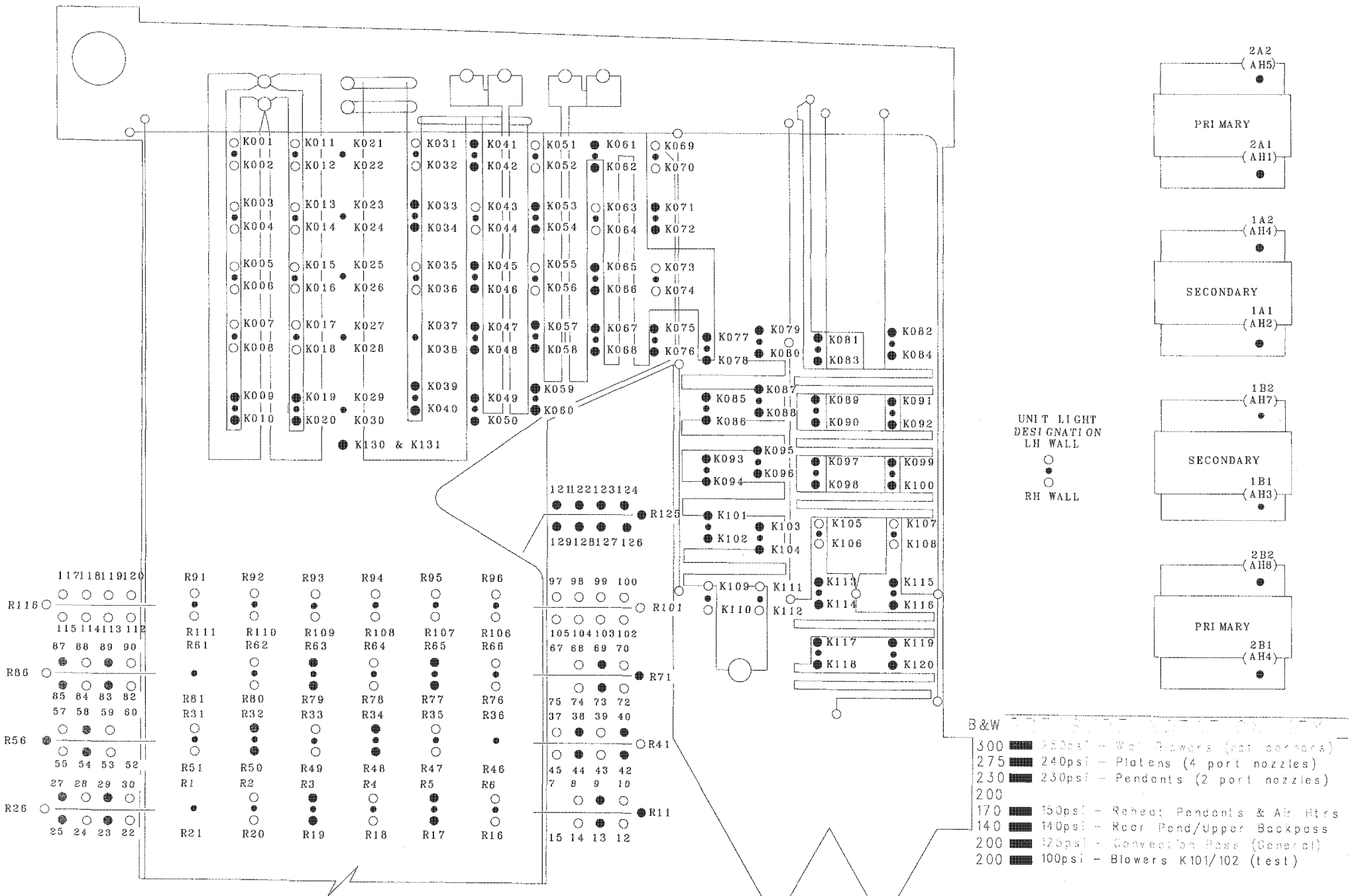
IP7010961

UNIT 2



IP7010962

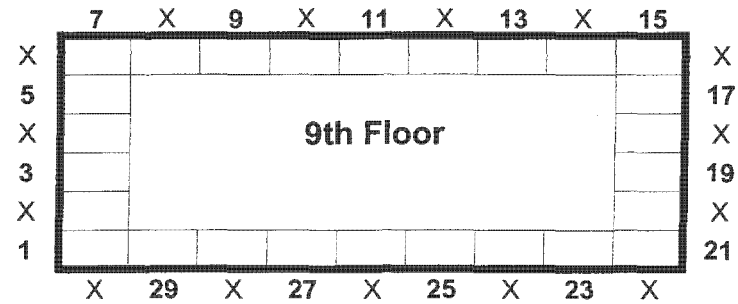
INTERMOUNTAIN POWER GENERATING STATION

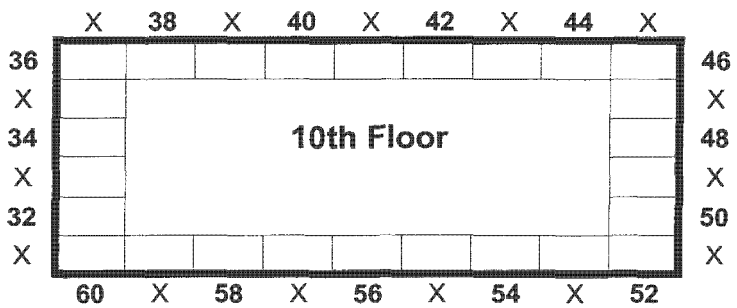


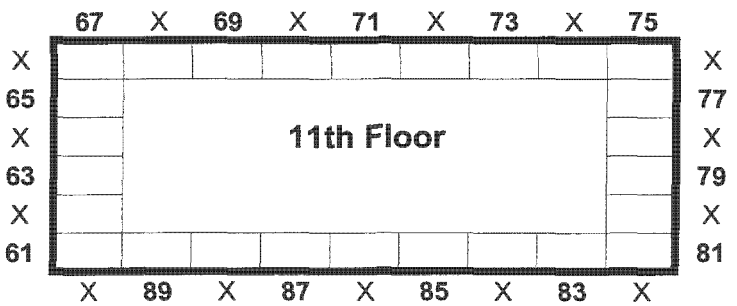
IP7010963

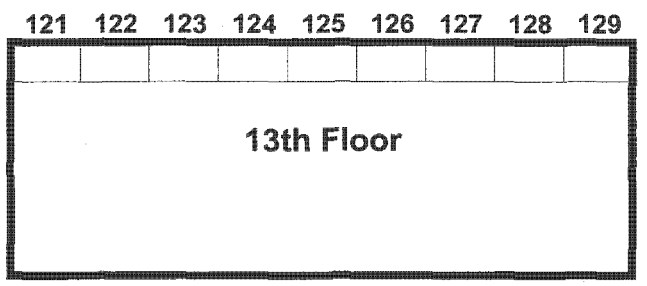
DRAWING #1

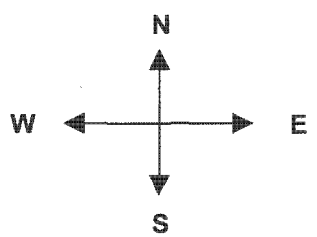
Wall sootblowers **Unit 1** 8-Mar-99











IP7010964

Predictive Maintenance- Work Group Meeting

AGENDA for December 2002 PdM Related Activities

Chairman: Gary Judkins — January 9, 2003

Item	Moderator
1. Vibration Exceptions Report	Craig-J
2. Lubrication Exceptions Report	Rob- J
3. Infrared Scanning Exceptions Report Ash water recycle transformer	Mike-N
4. Motor Circuit Analysis Exceptions Report	Mike-N
5. Transformer Oil Gas Analysis	Mike-N
6. Performance Exceptions Report	Dave-S/ Garry-C
7. CCCW Pump U1 1A incident review (bearing failure, motor failure)	Mike-N
8. CT Fan Blade Inspection- Final Report/ Results	Phong-D
9. CT Fan status- 2A02, 1A08	Hugh-L
10. Pulverizer Gearbox U2H- B&W rebuild statusof old gearbox	Alan-D
11. Pulverizer U2B Rotating throat- Babcock Power	Phil-H
12. Pulverizer Gearbox Breathers- problems	Gary-J
13. Conveyor #8 motor- bearing mod for mag coupling update	Mike-N
14. Circ Water Pump Impeller- changeout schedule	Phong-D
15. Makeup and Flush Pumps- rebuild schedule	Alan-D
16. Ignitor Booster Air Compressors- rebuild	Rick-H
Motors:- status 17. FD Fan Motor installation- NO	Jon-C

PREDICTIVE MAINTENANCE- EQUIPMENT HIT LIST

UNIT 1

Pulverizer Motor U1H- inboard bearing
Lube Oil indicating there has been bearing damage, currently . This has been a problem motor and the shaft at bearing is undersized (requires customized bearing). Sometime in near future,
Elect will open the bearing housing, inspect and repair and Maint will conduct alignment

U1 Main Transformer C phase connections- Hot spots, several loose connections (Outage item)

UNIT 2

U2 Main Transformer connections- Hot spot, loose connections (Outage item)

COMMON

PREDICTIVE MAINTENANCE- EQUIPMENT OUTAGE LIST

Upcoming scheduled PdM related Outages items:

Unit 2 Minor Outage, February 8-17, 2003

U2 Main Transformer connections- Hot spot, loose connections

U2 Turbine Balance (T2 & T10)- high vibration, balancing next minor outage 03/2003

U2 BFPT 1B- balancing

U2 Induced Draft Fans D & B- vibration at higher speeds, needs balanced next outage

Unit 1 Major Outage, March 1-31, 2003

Note: HP turbine replacement, Boiler modifications (platens and OFA)

U1 Main Transformer C phase connections- Hot spots, several loose connections

U1 Turbine Balance (T2, T3, T4 & T5)- high vibration on shaft riders and/or Bently, balancing will be required next major overhaul 03/2003

U1 IP Turbine- slow speed balance

Baghouse Reverse Air Fans 1A1 and 1A2- Inspect and field balance
Baghouse Reverse Air Fans 1B1 and 1B2- Inspect and field balance
Baghouse Reverse Air Fans 1C1 and 1C2- Inspect and field balance

Scrubber Inlet Damper SA Fan 1E1A- Field balance the fan.

U1 PAH 2A Support Bearing- change oil

TABLE OF CONTENTS

The following are the **Exceptions Reports** for the Predictive Maintenance Programs. Please call or e-mail if there are questions or comments.

I. VIBRATION MONITORING STATUS REPORT — For December 2002

The following is a **Monthly Exception Report** from the Vibration Monitoring Program. Problems that have been identified are listed and explained along with a recommendation on course of action. An asterisk (*) denotes items added to the list since the last published report.

During the month of December 2188 vibration points were collected and analyzed. 882 points in Unit #1, 803 points in Unit #2 and 493 points in the common areas.
If you have any questions about the equipment listed or other related concerns, please contact one of the following personnel in our Results Group:

Craig Jones	6485	Quinn Bean	6467	Bill Tanner	6480
Mike Nuttall	6474	Aaron Nissen	6482		

Ia. EXCEPTIONS REPORT with Current Recommendations and Analysis

UNIT 1

***Scrubber Mist Eliminator Pump 4A** WO # 03-94869-0 12/06/02
Recommendation- Check then correct alignment and Soft-foot.
Analysis- Work done earlier to rebuild pump skid has misaligned the pump/ motor.
Status- Work in planning.

Bypass Damper Fan 3A , 3B, 3C WO # 03-97113-0 11/12/02
Recommendation- modify the fan bearing safety shroud to allow vibration readings from the bearing surface.
Analysis- Vibration readings are not consistent taken at the present location.
Status- In planning.

Scrubber Inlet Seal Air Fan 1D1B WO # 03-97112-0 11/05/02
Recommendation- Field balance fan during up-coming Unit outage.
Analysis- This is a new motor/fan combination that now need balancing.
Status- In planning.

Baghouse Reverse Air Fans 1A1 and 1A2 WO # 03-88188-0 8/21/02
Recommendation- Outage Item. Descale and inspect these fan during the outage and tag them to allow a field balance check and possible field balance.
Analysis- Fans could have build-up of scale causing balance problems,
Status- In planning

Baghouse Reverse Air Fans 1B1 and 1B2 WO # 03-88194-0 8/21/02
Recommendation- Outage Item. Descale and inspect these fan during the outage and tag them to allow a field balance check and possible field balance.
Analysis- Fans could have build-up of scale causing balance problems,
Status- In planning

Baghouse Reverse Air Fans 1C1 and 1C2 WO # 03-88195-0 8/21/02
Recommendation- Outage Item. Descale and inspect these fan during the outage and tag them to allow a field balance check and possible field balance.
Analysis- Fans could have build-up of scale causing balance problems,
Status- In planning

Coal Pulverizer 1F WO # 03-82635-0 7/19/02
Recommendation- Repair and rehang hydraulic piping at the inboard side of the Pulverizer.
Analysis- Piping is hanging down and needs to be rehung and moved up higher.
Status- Has been released for work.

Scrubber Seal Air Fan 1B2B WO # 02-79191-0 6/3/02
Recommendation- Replace the fan rotor with a new one.
Analysis- The fan has exhibited high vibration for some time. A recent field balance could not correct the vibrations. During the field balance the fan rotor was found to have excessive axial run out. This is a problem that can not be corrected, so a replacement rotor is suggested.
Status- Released for work.

Scrubber Inlet Damper SA Fan 1E1A WO# 02-72386-0 3/29/02
Recommendation- Field balance the fan.
Analysis- The motor inboard running speed vibration is 0.36l/sec.
Status- Released for scheduling.

UNIT 2
BFPT Lube Oil Pump 1A1A WO #03-96090-0 12/24/02
Recommendation- Replace motor bearings and check bearing fits.
Analysis- Motor outboard bearing is making noise.
Status- A new outboard bearing has been installed. The outboard bearing bearing-to-housing fit is in question, so another motor is currently being rebuilt to inst5all in its place.

***Fluidizing Air Blower 1A** WO #03-95260-0 12/17/02
Recommendation- Rebuild the blower.
Analysis- Vibration levels have been high for several months and have recently taken a step increase. Data indicates bearing degradation.
Status- Work order has been released for scheduling.

***Bypass Damper SA Fan 3B** WO# 03-93793-0 12/03/02
Recommendation- Inspect drive belts and replace as necessary.
Analysis- Vibration levels and noise has increased.
Status- In planning.

Cooling Tower Fan 2A02 WO# 03-87632-4 11/05/02
Recommendation- Inspect drive coupling shim-pacs, drive shaft and gear-reducer input cartridge.
Analysis- Vibration levels at the gear-reducer input and the motor inboard are increasing. The frequency of the vibration is 1792 cpm.
Status- Maintenance inspected the fan and gear reducer 11/1/2002. The composite drive shaft has started to deteriorate and needs replacement. Maintenance replaced the drive shaft and the gear-reducer continues to operate with elevated vibration levels. The box will be replaced.

Induced Draft Fan 1B WO# 02-77945-0 06/03/02
Recommendation- Mechanical support for field balance of "1B" Induced Draft Fan during the next unit outage.
Analysis- Fan operates at 3.1 mils under high unit load conditions (higher rpm).
Status- Outage Item.

Induced Draft Fan 1D WO# 02-77881-0 04/25/02
Recommendation- Mechanical support for field balance of "1D" Induced Draft Fan during the next unit outage.
Analysis- Fan operates at 3.3 mils under high unit load conditions (higher rpm).
Status- Outage Item.

Common
Radial Sludge Stacker 2 WO # 03-92837-0 11/20/02
Recommendation- Tighten and replace broken belts and correct belt alignment.
Analysis- Vibration data indicates the belt alignment needs correction
Status- In planning .

Radial Sludge Stacker WOR # 99694 11/20/02
Recommendation- Replace motor bearings..
Analysis- Vibration data indicates the belt drive motor has failing motor bearings.
Status- In planning .

Ib. RESOLVED PROBLEMS
UNIT 1
***Circulating Pump 1A** WO # 03-94861-0 12/06/02
Recommendation- Loosen pump discharge expansion bolts.
Analysis- Vibration in the parallel plain has increased.

Results- Vibration in the parallel plain has been reduced.

***Ash Sluice Water Pump 1B** WO # 03-94427-0 12/06/02
Recommendation- Check Alignment and correct if necessary.
Analysis- Vibration levels of 2X have increase following early pump work.
Results- Alignment was check and pump returned to service with reduced 2 X vibration.

Cooling Tower Fan 1A02 WO # 03-92232-0 11/14/02
Recommendation- Repair motor
Analysis- Vibration level are increasing and vibration information indicates motor fan is rubbing or motor seals are rubbing.
Results- Motor was cleaned and returned to service. Follow-up data needed..

Reverse Air Fans 1B1 and 1B2 WO # 03-92233-0 11/14/02
Recommendation- Clean the cooling intake to the motors to prevent over heating.
Analysis- Cooling grate is blocked by oily build-up.
Results- Cooling grates were clean and returned to service.

Flame Scanner 1B WO # 03-94348-0 12/03/02
Recommendation- Correct keys in key-way to proper length..
Analysis- Vibration levels for 1X have been increasing follow some PM work.
Results- Attempts to balance the coupling area were tried but an imbalance in the coupling can not be corrected.

Scrubber Outlet Seal Air Fan 1E2A WO #03-91588-0 11/05/02
Recommendation- Replace motor bearings or replace the motor.
Analysis- G's vibrations are trending up for the motor bearings.
Results- Vibrations and G's were reduced with the installation of new bearings.

Baghouse By-pass Damper Fan 3C WO # 02-76667-0 5/16/02
Recommendation- Correct belt alignment and check belt sheave alignments.
Analysis- Vibrations on the fan are from belting problem and alignment.
Results- Vibrations were some what reduced. There is planned work to anchor the motor better, helping with the motor vibrations.

UNIT 2

Common
Emergency Sludge Stacker 1 WO # 03-92836-0 11/20/02
Recommendation- Tighten belts and check and correct belt alignment.
Analysis- Vibration data indicates the belt alignment needs correction.
Results- Follow-up data needed to be taken.

Ic. EQUIPMENT WARRANTING INCREASED MONITORING
The following equipment will be monitored on a more frequent basis due to identified and suspected vibration related problems.

UNIT #1
Reverse Air Fan 1C1
18A Coal Conveyor- Increased motor outboard vibrations.

UNIT #2
Fluidizing Air Blower 1A- Skid grouting. Blower noisy.
Coal Pulverizer E- Increased bevel gearset mesh frequency.
Cooling Tower Fan Motor 2A10- Running speed harmonics.
Cooling Tower Fan Motor 2A02- 1792rpm & harmonics.

COMMON
Coal Conveyor #8- coupling concerns

II. LUBRICATION ANALYSIS STATUS REPORT — For December 2002

The following is a Monthly Exceptions Report from the Lube Oil Analysis Monitoring Program of those samples showing variations in normal operating parameters. Some of the exceptions noted require no action, at this time, but are simply observations of the trending that might be occurring. Problems that have been identified are listed and explained along with a recommendation from Engineering Services on course of action.

The lubrication specialists sampled **301 oil samples** from **Dec 1, 2002 to Jan 1, 2003. 6 of the samples showed variations** that required action or increased monitoring. **10 WORs were initiated** on those requiring immediate action. There are **6 open work orders** from previous months.

If you have any questions about the equipment listed or other related concerns, please contact one of the following personnel in our Results Group: Rob Jeffery x 6490 Aaron Nissen x 6482

IIA. EXCEPTIONS REPORT with Current Recommendations and Analysis

UNIT 1 REVERSE AIR FAN 1C1 OUTBOARD MOTOR BEARING Sample#:20023008
ID: 1CCB-MTR-1C1-OT Oil Type: GST 46 Date Sampled:12/03/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: The viscosity of this sample is higher than specification. The current value at 40C is 62.3 cST. The maximum acceptable value for this lubricant at 40C is 60 cST. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 100015
WORK ORDER: 03-97253-0, FLUSH AND CHANGE OIL
STATUS: RELEASED

UNIT 1 REVERSE AIR FAN 1C1 INBOARD MOTOR BEARING Sample#:20023009
ID: 1CCB-MTR-1C1-IN Oil Type: GST 46 Date Sampled:12/03/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: The viscosity of this sample is higher than specification. The current value at 40C is 62.3 cST. The maximum acceptable value for this lubricant at 40C is 60 cST. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 100015
WORK ORDER: 03-97253-0, FLUSH AND CHANGE OIL
STATUS: RELEASED

UNIT 1 BOOSTER BOILER FEED PUMP 2B Sample#:20023042
ID: 1FWA-PMP-2B Oil Type: GST 46 Date Sampled:12/09/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water is visible in oil. Oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99873
WORK ORDER: 03-94928-0, FLUSH AND CHANGE OIL
STATUS: CLOSED

UNIT 1 COAL PULVERIZER 1E INBOARD MOTOR BEARING Sample#:20023048
ID: 1SGA-MTR-1E-IN Oil Type: GST 68 Date Sampled:12/09/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 328 ppm, the limit for water contamination is 300 ppm. The water contamination should be drained out through the sample port. Lubrication lab will take care of this and no further action is required.
WORK REQUEST: NA
WORK ORDER:
STATUS:

UNIT 1 COAL PULVERIZER 1G HYDRAULIC SKID Sample#:20023067
ID: 1SGA-HCU-1G Oil Type: AW HYD 46 Date Sampled:12/09/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 645 ppm, the limit for water contamination is 300 ppm. The

oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 100078
WORK ORDER: NOT YET WRITTEN, FLUSH AND CHANGE OIL
STATUS: RELEASED

EQUIPMENT: SERVICE AIR COMPRESSOR 1D INBOARD MOTOR BEARING Sample#:20023159
ID: 9CAA-MTR-1D-IN Oil Type: GST 46 Date Sampled:12/17/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 1001 ppm, the limit for water contamination is 300 ppm. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 100064
WORK ORDER: NOT YET WRITTEN, FLUSH AND CHANGE OIL
STATUS: RELEASED

OPEN WORK ORDERS FROM PREVIOUS MONTHS

UNIT 2 BOOSTER BOILER FEED PUMP 2A Sample#:20022874
ID: 2FWA-PMP-2A Oil Type: GST 46 Date Sampled:11/13/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: The viscosity of this sample is lower than specification. The current value at 40C is 28.60cSt. The minimum acceptable value for this lubricant at 40C is 38.00cSt. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99784
WORK ORDER: NOT YET WRITTEN, FLUSH AND CHANGE OIL
STATUS: SCHEDULED

EQUIPMENT: SLUDGE CONDITIONING CVY 5 HYD CLUTCH Sample#:20022867
ID: 9ASF-HCU-5 Oil Type: ATF Date Sampled:11/11/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: The viscosity of this sample is higher than specification. The current value at 40C is 87.10cSt. The maximum acceptable value for this lubricant at 40C is 46.80cSt. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99783
WORK ORDER: NOT YET WRITTEN, FLUSH AND CHANGE OIL
STATUS: RELEASED

UNIT 1 SCRUBBER SPRAY PUMP 2C SPEED REDUCER Sample#:20022524
ID: 1CCC-PMP-2C Oil Type: SHC 150 Date Sampled:10/09/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water is visible in oil. Oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99505
WORK ORDER: 03-89929-0, FLUSH AND CHANGE OIL
STATUS: SCHEDULED

UNIT 2 COOLING TOWER FAN GEAR BOX 2B09 Sample#:20022419
ID: 2HRC-FAN-2B09 Oil Type: AW MCH 220 Date Sampled:10/01/2002
EQUIPMENT CONDITION: **NORMAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 374 ppm, the limit for water contamination is 300 ppm. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99499
WORK ORDER: 03-89419-0, FLUSH AND CHANGE OIL
STATUS: RELEASED

UNIT 1 COAL PULVERIZER 1H INBOARD MOTOR BEARING Sample#:20022296
ID: 2SGA-MTR-1H-IN Oil Type: GST 68 Date Sampled:09/17/2002
EQUIPMENT CONDITION: **CRITICAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: WPC has increased significantly, the bearing was changed and the evidence in the

oil sample indicates there has been some bearing damage. The damage appears to have stabalized and the WPC has gone down throughout the week. The oil should now be changed and the equipment should be sampled weekly to monitor the bearing condition. The sampling will be handled by the lab personel.
WORK REQUEST: 99412
WORK ORDER:03-88258-0, FLUSH AND CHANGE OIL
STATUS: RELEASED

UNIT 2 COAL PULVERIZER 1G HYD VAR LOADING RES. Sample#:20021848
ID: 2SGA-HCU-1G Oil Type: AW HYD 46 Date Sampled:08/05/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 571 ppm, the limit for water contamination is 300 ppm. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99101
WORK ORDER: 03-84599-0, CHANGE OIL
STATUS: SCHEDULED

OTHER CONCERNS: There is still no oil recirc pump on UNIT 2 COOLING TOWER FAN 2A02 and therefore the samples taken from that gear box are biased.

IIB. EQUIPMENT WARRANTING INCREASED MONITORING

IIC. RESOLVED PROBLEMS

UNIT 2 COAL PULVERIZER 1A OUTBOARD MOTOR BEARING Sample#:20023097
ID: 2SGA-MTR-1A-OT Oil Type: GST 68 Date Sampled:12/10/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 340 ppm, the limit for water contamination is 300 ppm. The water contamination should be drained out through the sample port. Lubrication lab will take care of this and no further action is required.

UNIT 2 COAL PULVERIZER 1C INBOARD MOTOR BEARING Sample#:20023098
ID: 2SGA-MTR-1C-IN Oil Type: GST 68 Date Sampled:12/10/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water is visible in oil. The water contamination should be drained out through the sample port. Lubrication lab will take care of this and no further action is required.

UNIT 1 COAL PULVERIZER 1D INBOARD MOTOR BEARING Sample#:20023089
ID: 2SGA-MTR-1D-IN Oil Type: GST 68 Date Sampled:12/10/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 349 ppm, the limit for water contamination is 300 ppm. The water contamination should be drained out through the sample port. Lubrication lab will take care of this and no further action is required.

PREVIOUS MONTHS

UNIT 1 BOOSTER BOILER FEED PUMP 2B Sample#:20022862
ID: 1FWA-PMP-2B Oil Type: GST 46 Date Sampled:11/11/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 22683 ppm, the limit for water contamination is 300 ppm. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99782
WORK ORDER: NOT YET WRITTEN, FLUSH AND CHANGE OIL
STATUS: CLOSED

EQUIPMENT: COAL CONVEYOR 4 INBOARD MOTOR BEARING Sample#:20022921
ID: 9CHB-MTR-4-IN Oil Type: GST 32 Date Sampled:11/19/2002

EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 4100 ppm, the limit for water contamination is 300 ppm. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99787
WORK ORDER: NOT YET WRITTEN, FLUSH AND CHANGE OIL
STATUS: CLOSED

EQUIPMENT: COAL CONVEYOR 3 INBOARD MOTOR BEARING Sample#:20022929
ID: 9CHB-MTR-3-IN Oil Type: GST 32 Date Sampled:11/19/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: Water content is high at 2328 ppm, the limit for water contamination is 300 ppm. The oil should be changed to avoid equipment damage. A work request has been written to have this done.
WORK REQUEST: 99790
WORK ORDER: NOT YET WRITTEN, FLUSH AND CHANGE OIL
STATUS: CLOSED

UNIT 1 PRIMARY AIR HEATER 2A SUPPORT BEARING Sample#:20020911
ID: 1SGB-AHT-2A-SB Oil Type: SHC 639 Date Sampled:04/22/2002
EQUIPMENT CONDITION: **MARGINAL**, LUBRICANT CONDITION: **MARGINAL**
DISCUSSION/COMMENTS: The viscosity of this sample is lower than specification. The current value at 40C is 739.60cSt. The minimum acceptable value for this lubricant at 40C is 764.80cSt.
WORK REQUEST: 98400
WORK ORDER: 02-74810-0, CHANGE OIL
STATUS: CLOSED

III. INFRARED SCANNING STATUS REPORT

For December 2002

The following is a **Monthly Exception Report** from the Infrared Scanning Program. Problems that have been identified are listed and explained along with a recommendation on course of action. An asterisk (*) denotes items added to the list since the last published report.

During the month, 37 pieces of equipment were scanned and analyzed.
If you have any questions about the equipment listed or other related concerns, please contact one of the following personnel in our Results Group: Mike Nuttall 6474 Aaron Nissen 6482

IIIa. EXCEPTIONS REPORT with Current Recommendations and Analysis

UNIT 1

1GTB-XF-1, Main Transformer Arrester, C Phase **WO#02-79185-0** June 2002
Recommendation- Rework Connections next outage.
Analysis- The bolted connections at the top of the disconnect on phase C are hot. The connection has a 30C rise. This indicate an loose or corroded connection.
Status- Awaiting outage. Scanning monthly for changes.

1GTB-XF-1, Main Transformer Disconnect, C Phase **WO#02-79185-2** June 2002
Recommendation- Rework Stab Connection next outage.
Analysis- The switch shows heating in the stab connection on the line side of the phase A disconnect. There is about a 10C rise. This indicates a contact problem. The problem is not very severe and can wait until the next scheduled outage.
Status- Awaiting outage. Scanning monthly for changes.

1GTB-XF-1, Main Transformer Arrester, A Phase **WO#02-79185-03** June 2002
Recommendation- Rework Connections next outage.
Analysis- The bolted connections at the top of the disconnect on phase A are hot. The connection has a 10C rise. This indicate an loose or corroded connection.
Status- Awaiting outage. Scanning monthly for changes.

UNIT 2

2GTB-XF-1, Main Transformer **WO# 03-83915** July 2002
Recommendation- Rework the TB AF point 8 connection and replace the lug.
Analysis- The connection on TB AF point 8 has a hot connection on the lower connection. There is about a 15C rise. This indicates either a connection problem or a bad crimp. This circuit feeds the power to one of the phases on the cooling fans on the heat exchanger.
Status- Generating work order.

COMMON

CONVERTER STATION

Scanning was performed on the converter station transformers due to high wind. No problems were found. Scanning was also performed on previous repairs to check the repair status.

IIIb. RESOLVED PROBLEMS

The following equipment problems have been resolved during the last month.

UNIT 1 *UNIT 2* *COMMON* *CONVERTER STATION*

IIIc. EQUIPMENT WARRANTING INCREASED MONITORING

The following equipment will be monitored on a more frequent basis due to identified and suspected thermal problems.

UNIT #1 UNIT #2 COMMON

IIId. UPCOMING TESTING

Roof Scans - Several of the roofs will be scanned to identify failures in the roofing system.

IV. MOTOR CIRCUIT ANALYSIS STATUS REPORT

For December 2002

The following is a Monthly Exception Report from the Motor Circuit Analysis Program. Problems that have been identified are listed and explained along with a recommendation on course of action. An asterisk (*) denotes items added to the list since the last published report.

During the month, **4 pieces** of equipment were tested. The motor test set software was upgraded to build 119. This provides mainly bug fixes and additional features.

If you have any questions about the equipment listed or other related concerns, please contact one of the following personnel in our Results Group: Mike Nuttall 6474 Aaron Nissen 6482

IVa. EXCEPTIONS REPORT with Current Recommendations and Analysis

UNIT 1

UNIT 2

COMMON

9WSC-P-1, Service Water Pump 2B **WO#** December 2003

Recommendation- Rewind.

Analysis- High winding and inductive imbalance in the motor windings. This indicates shorted turns in the winding. This requires a rewind to repair.

Status- Awaiting rewind.

IVb. RESOLVED PROBLEMS

The following equipment problems have been resolved during the last month.

UNIT 1

UNIT 2

COMMON

IVc. EQUIPMENT WARRANTING INCREASED MONITORING

The following equipment will be monitored on a more frequent basis due to identified and suspected vibration related problems.

UNIT #1

UNIT #2

COMMON

Coal Conveyor 8 - Motor starting current baseline taken to be used for installation of the new magnetic coupling. The Conveyor 8 spare motor is currently being modified to limit the float for use with the new magnetic coupling.

VI. PERFORMANCE MONITORING STATUS REPORT — For December 2002

The following is a Monthly Exception Report from the Performance Monitoring Program. Problems that have been identified are listed and explained along with a recommendation on course of action.
An asterisk (*) denotes items added to the list since the last published report.

Monthly VWO Test is scheduled for December 16, 2002 on Unit 1 and December 23, 2002 on Unit 2.

If you have any questions about the equipment listed or other related concerns, please contact one of the following personnel in our Results Group:
David Spence ext 6449 Garry Christensen ext 6486 Aaron Nissen ext 6482

VIa. EXCEPTIONS REPORT with Current Recommendations and Analysis

UNIT 1

BFPT 1B HP Stop Valve Stem Leakoff Leak - WO 02-76634 11/02
Recommendation - Repair 1B BFPT HP stop valve 1FWA-XV-1B1 stem leakoff seat/seal.
Analysis - Stem leakoff line is blowing superheated steam into drain funnel. Leak rate is increasing. Pressure and leakage from the stem indicates that the HP stop valve is leaking either through the pilot valve or the seat disk.
Status - Covered under outage WO already submitted.

Boiler Drum Relief Valve Leaks - WO 03-94367 12/02
WO 03-94368 12/02
Recommendation - Overhaul boiler drum relief valves 1SGF-RV-1, 6.
Analysis - These valves are starting to leak. Steam coming from vent stacks visible on cold mornings. Valve discharge pipes are 20 deg hotter than adjacent pipes.
Status - U2 Spring '02 outage work orders?

Soot Blower Steam Supply to Air Heater Relief Valve Leak - WO 03-94364 12/02
Recommendation - Overhaul soot blower steam supply to air heaters relief valve 1SGI-RV-8
Analysis - Steam visible from vent stack. Valve body and discharge temp is higher than adjacent valve.
Status - Work order released.

Boiler Drum East End Downcomer Drain Leak - WO 03-88774-0 9/02
WO 03-88774-1 9/02
Recommendation - Replace/repair 1SGF-BV-69 & 70 boiler drum east end downcomer drain valves.
Analysis - These valves are in series and both are leaking. Leak indicated by high discharge line temperature. Recommend opening the downstream valve first and closing it last to prevent valve seat damage on the inner (upstream) valve. This would preserve the upstream valve seat and significantly increase the life of these valves.
Status - WO's released. Need to schedule repair during unit outage.

Secondary Superheater Platen Inlet Header Drain Leak - WO 03-88204 9/02
WO 03-88762 9/02
Recommendation - Replace/repair drain valves on the secondary superheater platen inlet drain header. 1SGF-MBV-50 and 1SGF-BV-49.
Analysis - These valves are in series on the drain line. Both drain valves are leaking. Leak indicated by high temperature downstream of MBV-50.
Status - WO's released. Need to schedule work during unit outage.

Economizer Inlet Header Drain Leak - WO 03-88757 9/02
WO 03-88205 9/02
Recommendation - Replace economizer feedwater inlet stop valve body drain shutoff valves, 1SGA-BV-131 & 132. Repair seat on economizer inlet header drain valve, 1SGF-BV-31.
Analysis - The economizer stop valve body drain valves are leaking into the economizer inlet header drain line. BV-31 which is downstream of these valves is also leaking. Recommend trying to repair the seat on BV-31 in-place since it is a large valve and the seat damage is minimal.
Status - WO's released.

Stop & Control Valve Before Seat Drain Valves - WO 03-85144 8/02
WO 03-85146 8/02
WO 03-85147 8/02
WO 03-85148 8/02

Recommendation - Replace leaking stop & control valve before seat drain valves 1TGC-MBV-34, 35, 37, 39. Investigate root-cause of failures.
Analysis - These valves started leaking after the last unit trip. Shear pins are breaking on the actuator to valve stem bushing so the valves are not fully closing. Investigating changing pneumatic actuators and upgrading to double-seated ball valves.
Status - WO's for valve warranty replacement released (outage work). Phong Do is working with valve OEM (Mogas) and actuator OEM (Limitorque) to resolve root-cause of failures.

Main Steam Lead Drain Leak - WO 03-86328-0 8/02
Recommendation - Replace 1TGC-MBV-49 main steam line lead drain.
Analysis - Valve is fully closed and leaking. Leak indicated by high (>300 deg) discharge temperature. This valve was replaced in 1994.
Status - WO released. Need to schedule work during unit outage.

Dearator Vent Drain - WO 02-64126 1/02
Recommendation - Increase size of drip-leg on the condensate drain line from the deaerator vent.
Analysis - Condensate is blowing from vent line onto the boiler building roof. Roof is always wet around the vent line. Entrained condensate in the vent line is bypassing the drip leg. Drip leg needs to be sized the same as the pipe size.
Status - WO for modification of the drain line has been assigned to Dean Wood.

BFP 1B Inlet Strainer High DP - WO 03-81535 7/02
Recommendation - Inspect 1FWA-STR-5 1B BFP inlet strainer for damage or plugging.
Analysis - Strainer differential pressure is 120" wc. This is 35" higher than 1A BFP inlet strainer dp.
Status - WO Released.

ID Fan Drive Seal - WO 03-85776 8/02
Recommendation - Replace as needed and set drive shaft seal on all ID fans.
Analysis - Excessive seal openings on all ID fans.
Status - Outage work order.

E Secondary Air Damper -
Recommendation - Replace the bearings on the east secondary air dampers.
Analysis - Damper continues to stick near 100% open.
Status - Outage work order.

UNIT 2
Drum Blowdown Shutoff Valve Leak - WO 03-88257 9/02
Recommendation - Replace boiler drum blowdown shutoff valve 2SGA-MBV-4.
Analysis - Steam and condensate flow from tell tale valves when MBV-4 is closed. This valve was replaced in Spring 2000. The valve is still under warranty from Mogas.
Status - WO released.

Main Steam Lead Drain Leak - WO 03-88244 9/02
Recommendation - Replace 2TGC-MBV-49 main steam line lead drain.
Analysis - Valve is fully closed and leaking. Leak indicated by high (>300 deg) discharge temperature.
Status - WO released. Need to schedule work during unit outage.

4th Stage Extraction Drain Steam Trap Leaks - WO 03-87569 9/02
WO 03-97570 9/02
Recommendation - Rebuild 4th stage extraction drain steam traps 2TEC-TRP-1 & 2.
Analysis - Both of these traps are blowing by. Checked by routing trap discharge to floor drains and observing steam flow.
Status - WO's released.

11th Stage Extraction Drain Steam Trap Plugged - WO 03-87571 9/02
Recommendation - Rebuild 11th stage extraction drain steam trap 2TEC-TRP-5.
Analysis - Trap discharge temperatures indicate the trap is plugged. This is an impulse trap that has a minimal pilot leak flow in normal operation.
Status - WO released.

14th Stage Extraction Drain Steam Trap Leaks - WO 02-74812 4/02
WO 03-87568 9/02
Recommendation - Replace leaking 14th stage extraction drain steam traps 2TEC-TRP-9 & 10.
Analysis - Trap leaks indicated by trap discharge temperatures. Checked by isolating the trap discharge and checking leak flow to floor drains.
Status - WO's released.

SSH Aux Steam Supply Trap Problems - WO 02-74806-0 4/02
WO 02-74806-3 9/02
WO 03-88241 9/02
Recommendation - Complete work required to restore the secondary superheater auxiliary steam supply drain trap 2SGA-TRP-2 to service.
Analysis - Trap inlet isolation and bypass are leaking. Trap also needs to be rebuilt. This trap is always blowing by. It is valved out until repairs.
Status - WO's released for isolation valve replacement and trap rebuild. WOR submitted for bypass valve replacement.

BFP Recirc Valve Inlet Strainer Failures - WO 03-83248-2 8/02
Recommendation - Investigate alternative inlet strainer designs and valve actuator set up on main and standby boiler feed pump recirculation valves FWA-ACV-17, 18, 19.
Analysis - Several failures on these valves are due to the inlet strainer collapsing. Pieces of the inlet strainer are damaging the seat and limiting the valve stroke preventing the valve from closing completely. These valves are typically lasting less than 1 year after a rebuild before they start leaking. Copes-Vulcan the valve OEM says that they should go 10 years before leaking. Valve trim reconditioning is currently being done by a non-OEM company for half the cost of the OEM repair.
Status - The screen assembly on the current trim reconditioning is being modified to increase the strength of the screen by (1) using a heavier gage screen material, (2) replacing the screen support bolts with stainless steel bolts, and (3) increasing the tack weld to prevent the bolts from coming out.

CRV2 After Seat Drain Leak - WO 02-78605 6/02
Recommendation - Repair/replace 2TGC-MBV-32, combined reheat valve #2 after seat drain valve during unit outage.
Analysis - This valve started leaking after the U2 spring 02 outage. Several attempts to hand tighten this valve have not reduced leakage. Leakage indicated by high temps in discharge line.
Status - WO released. Need to schedule work during unit outage.

ID Fan Drive Seal - WO Req 99140 8/02
Recommendation - Replace as needed and set drive shaft seal on all ID fans.
Analysis - Excessive seal openings on all ID fans.
Status - Outage work order.

VIb. COMPLETED TESTING AND RESOLVED PROBLEMS
UNIT 1
Monthly VWO Testing - VWO performance testing at throttle valves wide-open and 2400 psig throttle pressure conducted on 12/16/02.

Boiler and Turbine Cycle Isolation - Boiler and turbine cycle drains and isolation points were checked during the performance test on 12/16/02.

LOI Daily Results- Monthly LOI average on Unit 1 was 1.45% on the east and 1.21% on the west. Fly ash average was below the .55 limit 2.0% of the time sampled on the east and 2.9% of the time sampled on the west during the month. Approx.2,750 tons of fly ash was collected from Unit 1 during the month out of a possible

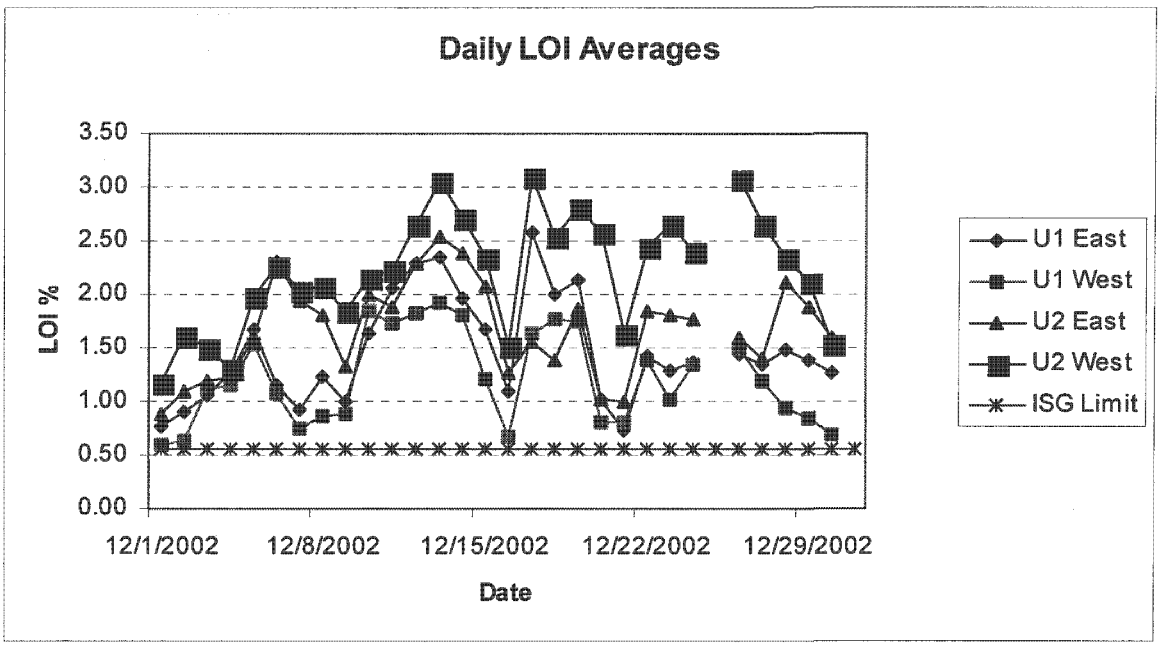
13,640 tons (20% of possible).

UNIT 2

Monthly VWO Testing - VWO performance testing at 900 Mw and reduced turbine throttle pressure conducted on 12/23/02.

Boiler and Turbine Cycle Isolation - Boiler and turbine cycle drains and isolation points were checked during the performance test on 12/23/02.

LOI Daily Results- Monthly LOI average on Unit 2 was 1.70% on the east and 2.20% on the west. Fly ash average was below the .55 limit 0.0% of the time sampled on the east and 0.0% of the time sampled on the west during the month. Approx. 550 tons of fly ash was collected from Unit 2 during the month out of a possible 13,640 tons (4% of possible).



VIc. CURRENT PROJECTS

VII. PERFORMANCE TESTING STATUS The following is a brief status of the major testing, **VIIa**) scheduled for the upcoming month, **VIIb**) completed testing, **VIIc**) brief summary of the results, and **VIId**) routine monitoring information.

VIIa. SCHEDULED TESTING: (upcoming months)	Unit #	Date
1. **Monthly Performance/Capacity Test**	**Unit 1**	Jan 20, 2003

Unit 1 Test Requirements: **890** Mwg/VWO/**2400**psig/1000F/1000F all normal equip operating (7 pulvs, all CT fans, etc.).

2. **Monthly Performance Test**	**Unit 2**	Jan 27, 2003

Unit 2 Test Requirements: **900** Mwg/VWO/**2180**psig/1000F/1000F all normal equip operating (7 pulvs, all CT fans, etc.).

VIIb. COMPLETED TESTING: (last test)	Unit #	Date
1. **Monthly VWO normal throttle pressure**	Unit 1	Dec 16, 2002
2. **VWO normal reduced throttle pressure turbine test**	Unit 2	Dec 23, 2002

VIIc. RESULTS:

1. Monthly Performance/Capacity Tests

Unit 1 Results -Routine performance test was conducted Dec 16, 2002. The unit operated at turbine valves-wide-open for 5h 40min at an average load of 891.8 MW and 6570 kpph throttle flow. No operational problems were observed during the test. Test data was taken and unit performance was calculated from 10:30 to 12:30. During this period the unit was isolated from outside steam sources with no sootblowing or blowdown.

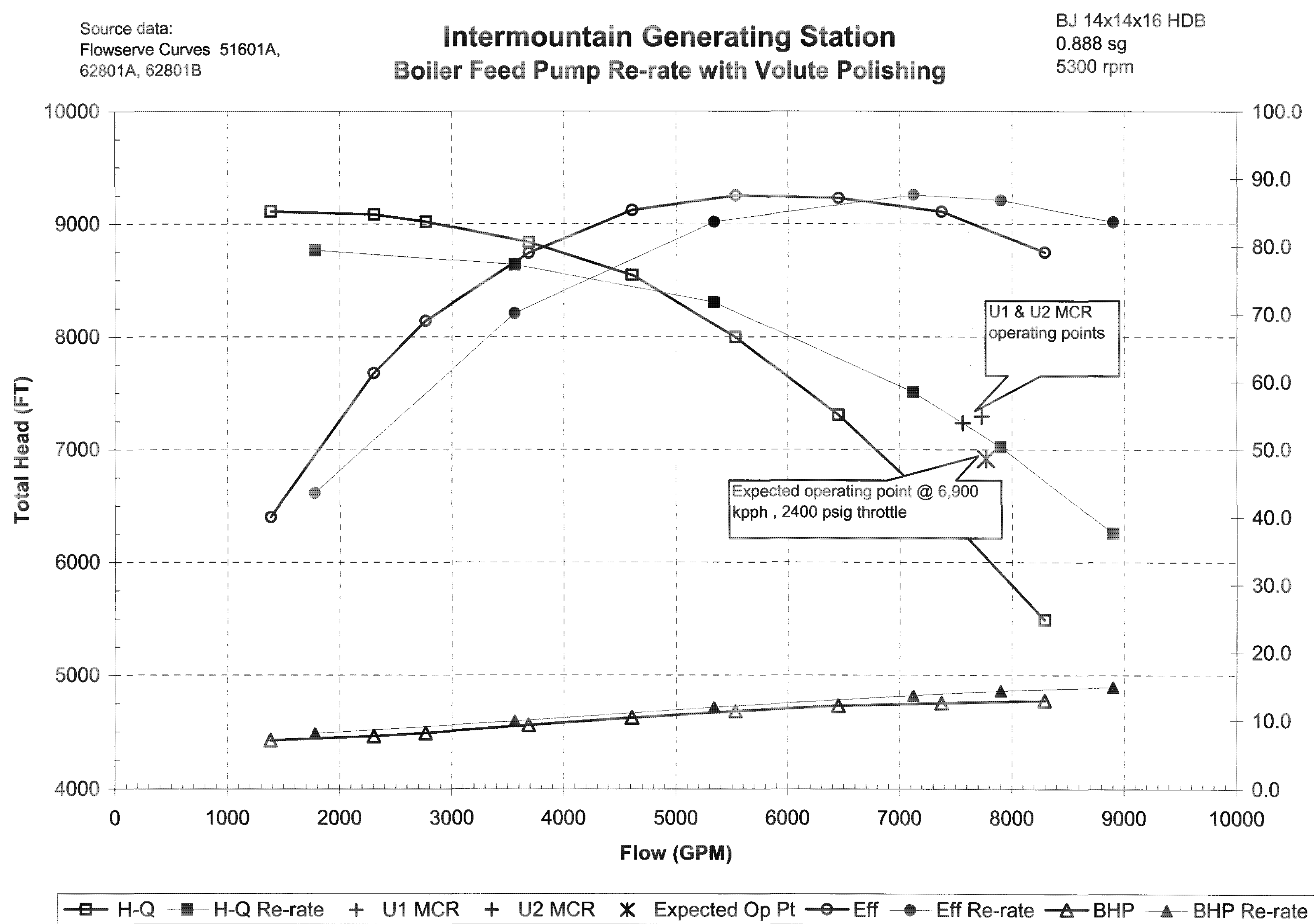
Key turbine cycle performance parameters measured during the test and corrected to design throttle and reheat conditions are: 8019 Btu/kwh net turbine cycle heat rate, 85.21% HP turbine efficiency, 90.94% IP turbine efficiency at 882.2 MW corrected load and 6,586 kpph corrected throttle flow. Test results show that there has been no significant change in any turbine cycle performance from the last test conducted in November 2002, and no variations from long term performance trends.

For a complete summary of Unit 1's test results and trends, refer to the December 2002, Performance Monitoring Status report.

Unit 2 Results - Routine performance test was conducted Dec 23, 2002. Testing conducted at 900 Mw with reduced throttle pressure (2172 psig) to get control valves wide-open. This will be the routine turbine cycle performance test conditions for future tests. The unit operated at turbine valves-wide-open for 3h 55min at an average load of 902.6 MW and 6176 kpph throttle flow. No operational problems were observed during the test. Test data was taken and unit performance was calculated from 09:30 to 10:30. During this period the unit was isolated from outside steam sources with no sootblowing or blowdown.

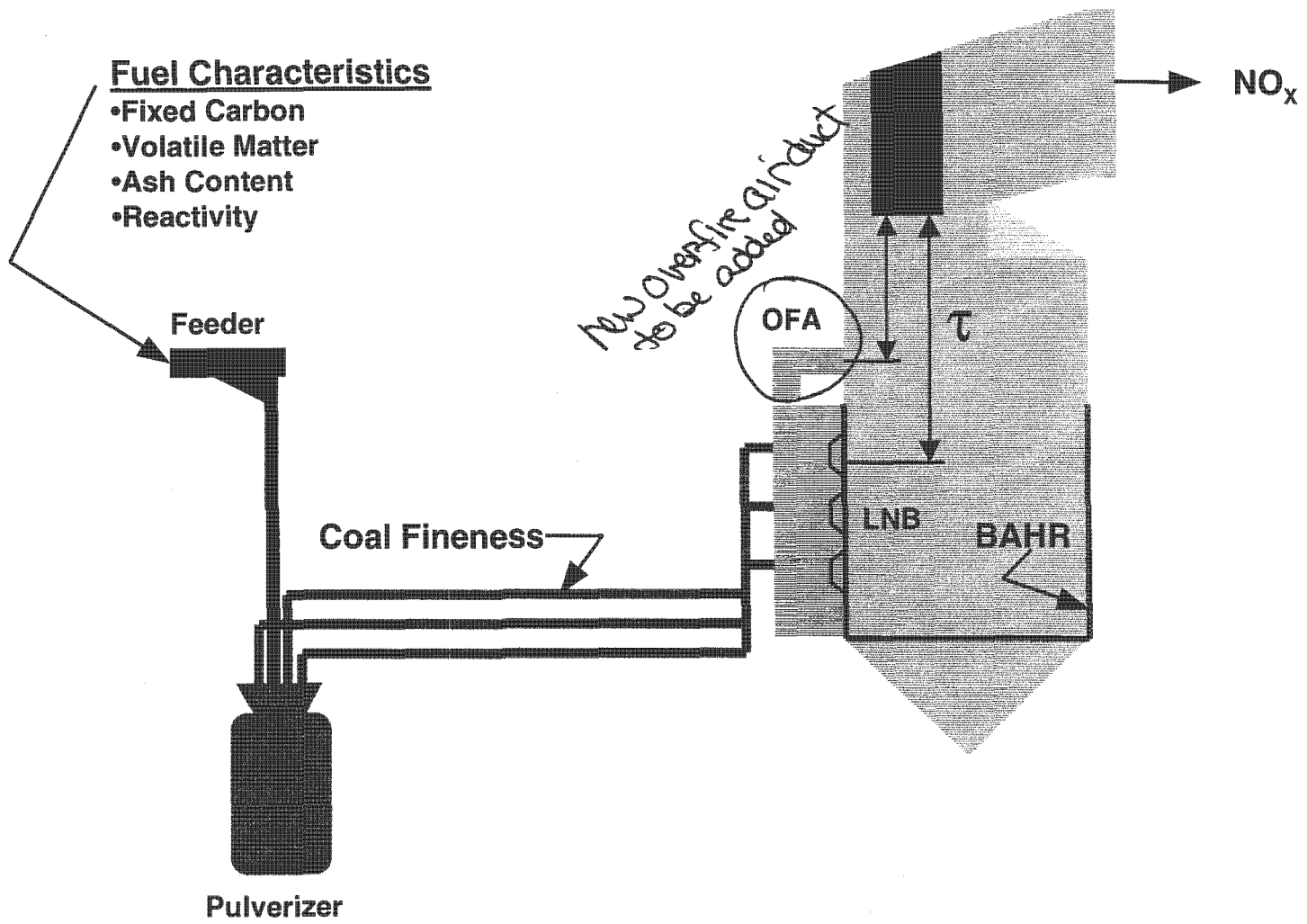
Key turbine cycle performance parameters corrected to design cycle conditions are: 7747 Btu/kwh net turbine cycle heat rate, 91.93% HP turbine efficiency, 91.93% IP turbine efficiency at 978.25 MW corrected load and 7016 kpph corrected throttle flow.

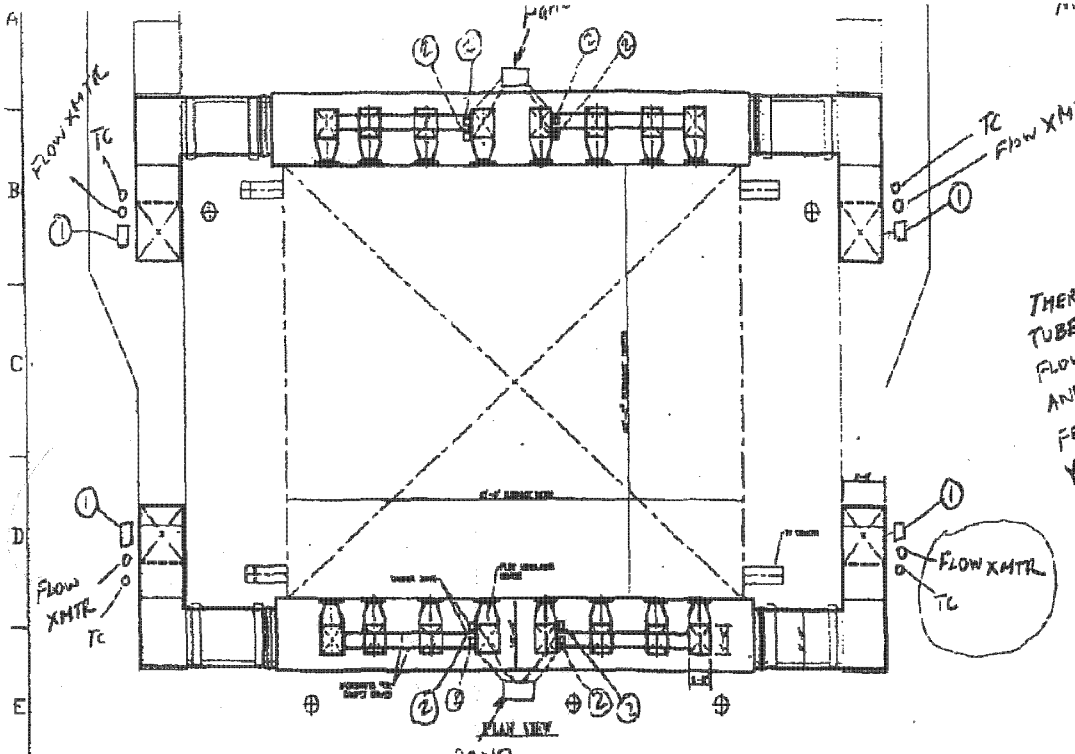
For a complete summary of Unit 2's test results and trends, please refer to the December 2002, Performance Monitoring Status report.


Source data:
Flowserve Curves 51601A, 62801A, 62801B
Intermountain Generating Station
Boiler Feed Pump Re-rate with Volute Polishing
BJ 14x14x16 HDB
0.888 sg
5300 rpm
Total Head (FT)
Efficiency (%), BHPx1000
Flow (GPM)
U1 & U2 MCR operating points
Expected operating point @ 6,900 kpph , 2400 psig throttle
H-Q
H-Q Re-rate
U1 MCR
U2 MCR
Expected Op Pt
Eff
Eff Re-rate
BHP
BHP Re-rate

IP7010982

NOx & UBC Factors

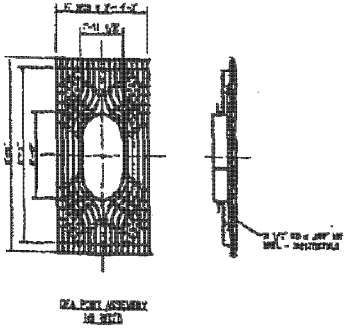




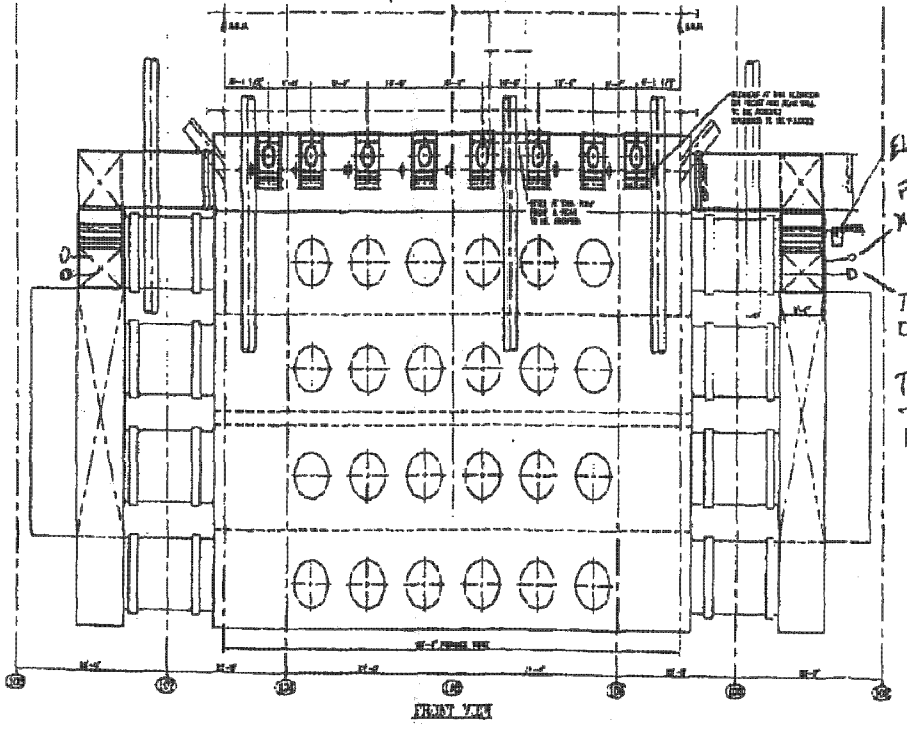
SUPPLY DUCT AIR DAMPERS – DRIVES HAVE INTEGRAL 4-20 SERVO AMPLIFIERS AND LOOP POWERED POSITION XMTRS. NO LIMIT SWITCHES (OTHER THAN INTERNAL TO STOP MOTOR AT END OF TRAVEL (4 DRIVES)

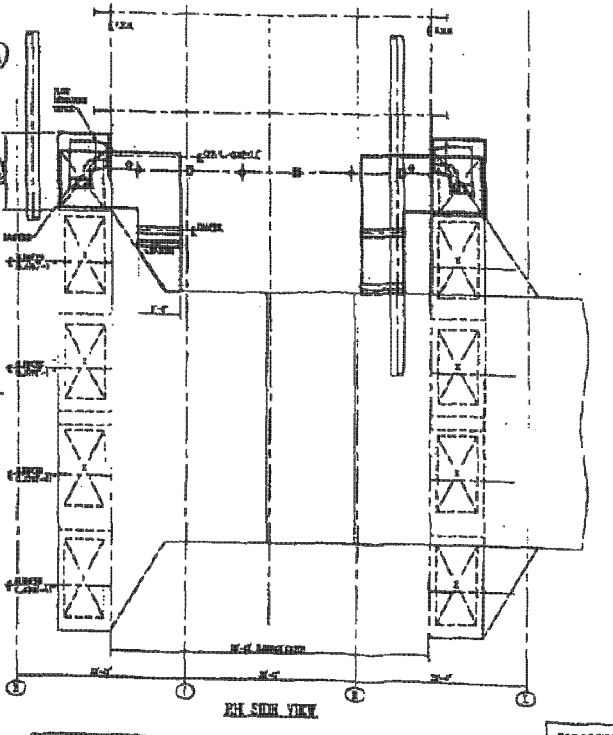
WIRING DIRECTLY TO DRIVES

THERE IS A PITOT TUBE AND 2 WIRE FLOW XMTR (DP) AND A T/C ON EACH FEEDING DUCT. YOU WIRE DIRECTLY TO XMTRS AND T/C'S.



NOTE: DRIVES (2) ARE SIMILAR TO (1) DRIVES EXCEPT THAT ELECTRONIC SERVOS ARE MOUNTED EXTERNALLY ON PANELS SHOWN AT EACH SIDE OF THE UNIT. YOU WIRE TO PANELS AND 5 WIRES FROM PANEL TO EACH DRIVE (8 DRIVES)

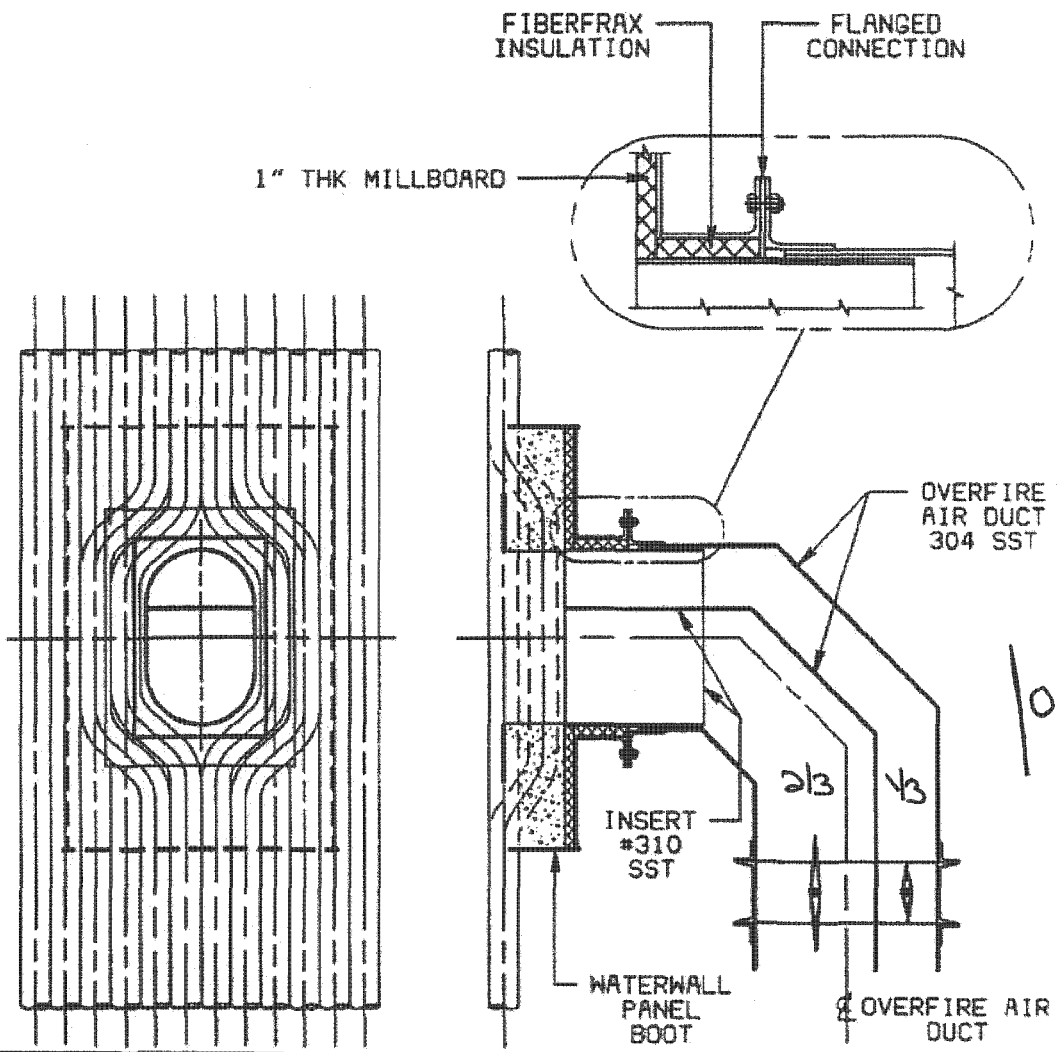




BABCOCK BORING POWER, Inc.

IP7010984

Standard OFA Nozzle Mechanical Design

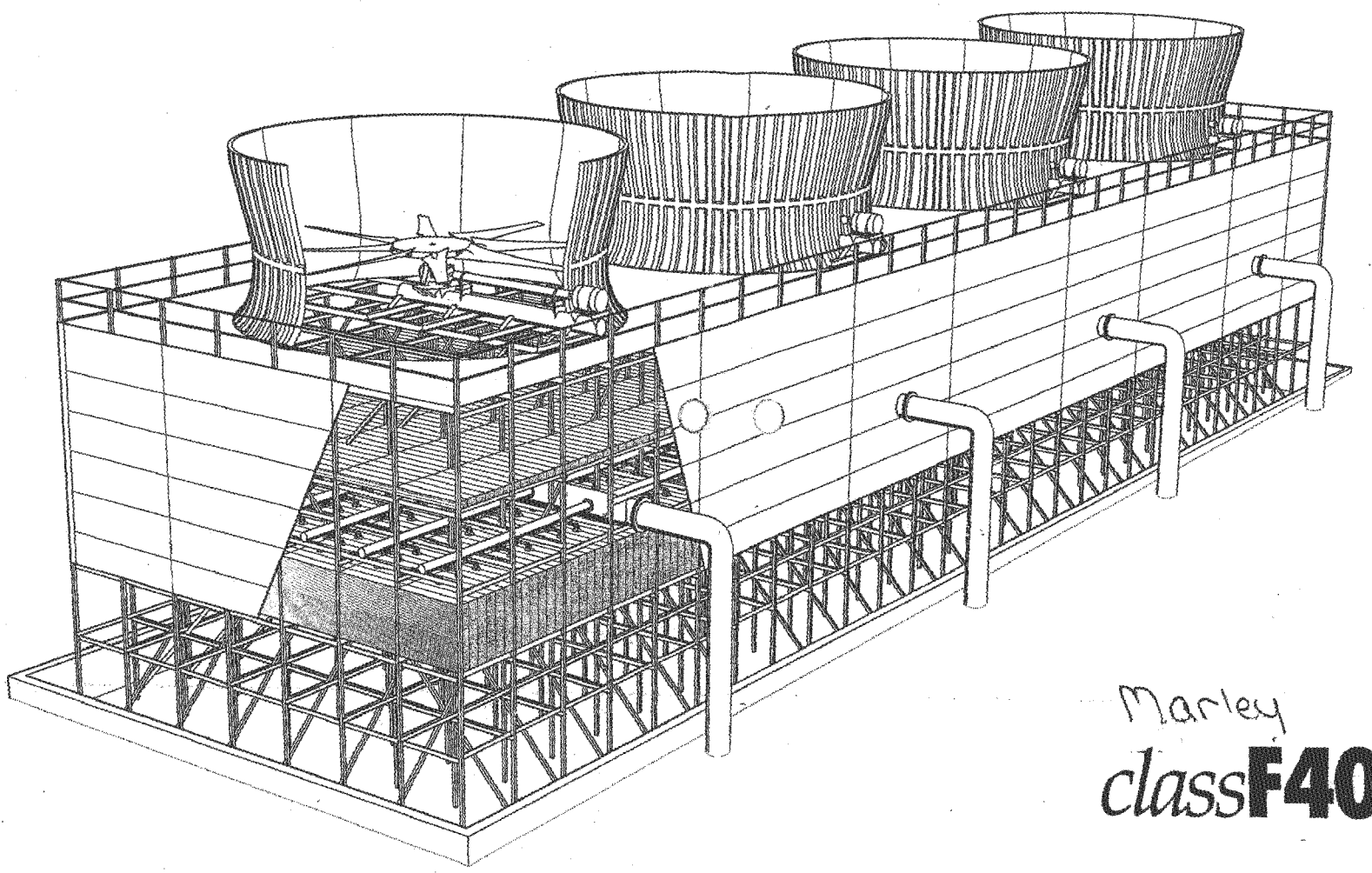


new overfire air ports (8) above each burner plus 2 in corners

existing top burner row

front view

Heber Cooling Tower

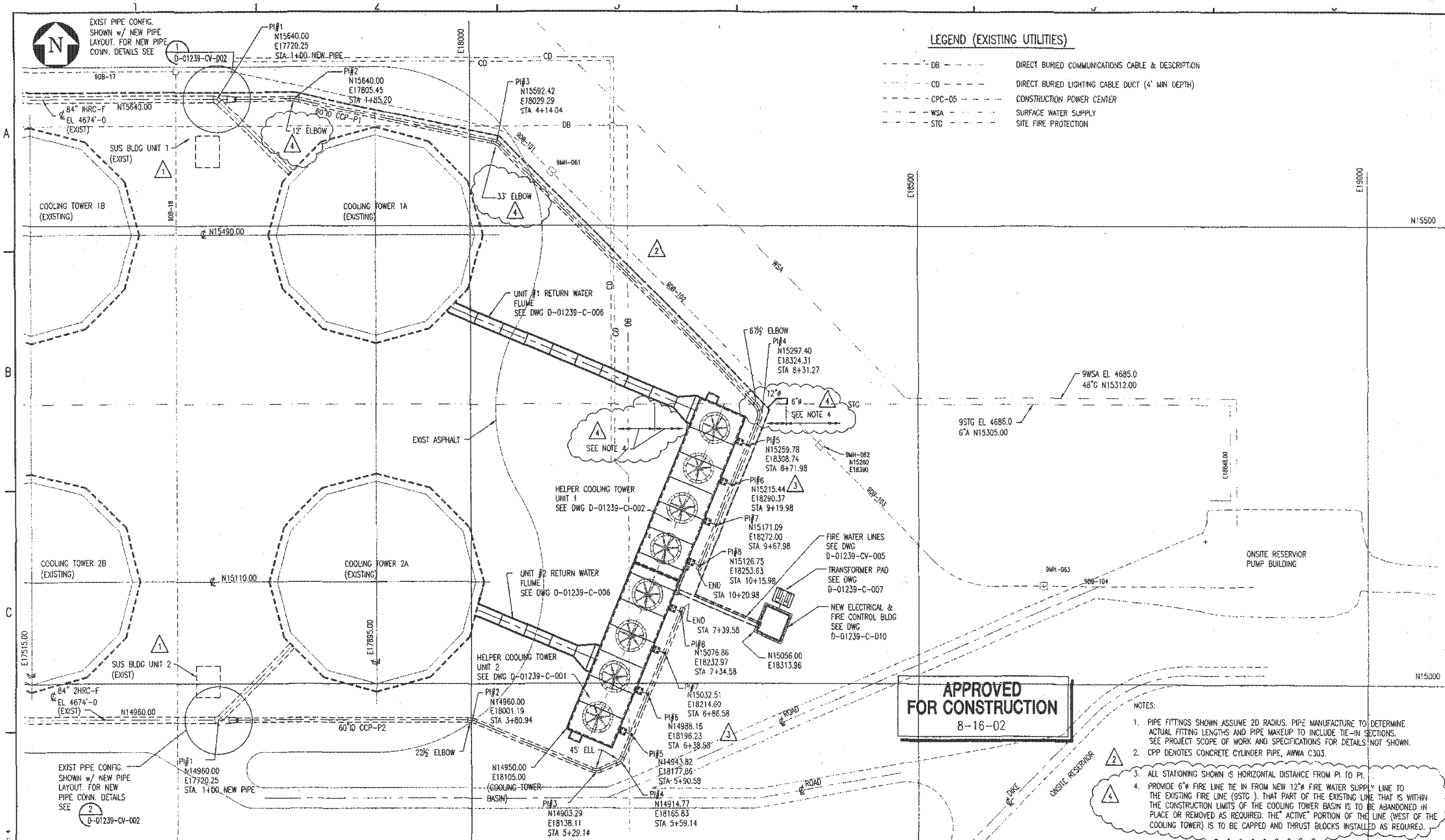


Marley

classF400

IP7010986

Helper Cooling Tower
Marley - fiberglass rectilinear
counterflow 4 CT fans / CT-Helper



NOTES:

1. PIPE FITTINGS SHOWN ASSUME 2D RADIUS. PIPE MANUFACTURE TO DETERMINE ACTUAL FITTING LENGTHS AND PIPE MAKEUP TO INCLUDE TIE-IN SECTIONS. SEE PROJECT SCOPE OF WORK AND SPECIFICATIONS FOR DETAILS NOT SHOWN.
2. CPP DENOTES CONCRETE CYLINDER PIPE, AWWA C303.
3. ALL STATIONING SHOWN IS HORIZONTAL DISTANCE FROM PI TO PI.
4. PROVIDE 6"ø FIRE LINE TIE IN FROM NEW 12"ø FIRE WATER SUPPLY LINE TO THE EXISTING FIRE LINE (9STG). THAT PART OF THE EXISTING LINE THAT IS WITHIN THE CONSTRUCTION LIMITS OF THE COOLING TOWER BASIN IS TO BE ABANDONED IN PLACE OR REMOVED AS REQUIRED. THE "ACTIVE" PORTION OF THE LINE (WEST OF THE COOLING TOWER) IS TO BE CAPPED AND THRUST BLOCKS INSTALLED AS REQUIRED.

REVISIONS

NO	DESCRIPTION	DATE	BY	CHK	APP
1	ADD SUS BLDGS	5-2-02	GLT	DRS	GB
2	RELOCATE PIPELINE CCP-1, ADD FIRE	–	–		
	PROTECTION, REVISE SUS BLDG	5-28-02	GLT	DRS	GB
3	ADD COORDINATES @ PIPE RISERS	6-7-02	GLT	DRS	
4	ADD STATIONING & NOTE, REVISE ELBOWS	–	–		
	ADD NOTE 4 & TIE 9STG TO NEW 12" LINE	8-14-02	GLT	TE	

REFERENCE DRAWINGS

DRAWING NO	TITLE
D-01239-CV-002	PIPE PROFILES & DETAILS
D-01239-CV-003	SITE GRADING AND PAVING PLAN
D-01239-C-001	COOLING TOWER BASIN CONC. PLAN SHT 1
D-01239-C-002	COOLING TOWER BASIN CONC. PLAN SHT 2
D-01239-CV-004	UNDERGROUND UTILITY PLAN AND DETAILS
D-01239-CV-005	FIRE WATER SUPPLY PLAN & DETAILS

ISSUE RECORD

DATE	ISS	REV	TO	FOR
4-22-02	1	0	CLIENT	PIPE BID
5-15-02	2	1	CLIENT	CONSTRUCTION
6-04-02	3	2	CLIENT	BID
8-16-02	4	4	CLIENT	CONSTRUCTION

ENGR RECORD

	BY	DATE
DRAWN	GLT	3-19-02
ELEC. CHECK		
INST. CHECK		
MECH. CHECK		
PIPING CHECK		
PROCESS CHECK		
STRUCT. CHECK	BTT	4-18-02
LEAD ENG./DES.	GB	4-22-02
DISCIPLINE MGR.	GB	4-22-02
CONST. REVIEW		
PROJECT ENG.		
CLIENT APPROVAL		

CURRENT DRAWING STATUS

STATUS	BY	DATE
PRELIMINARY OR PLANNING		
APPROVED FOR FINAL DESIGN		
IN FINAL DESIGN		
APPROVED FOR QUOTE/PURCH		
APPROVED FOR CONSTRUCTION	TD	5-14-02

LICENSED PROFESSIONAL STRUCTURAL ENGINEER 8-15-02 No. 180172 GLENN C. BARTON STATE OF UTAH

CEntry CONSTRUCTORS & ENGINEERS Salt Lake City, Utah

TITLE INTERMOUNTAIN POWER HELPER COOLING TOWER SITE PLAN

FOR INTERMOUNTAIN POWER — DELTA, UTAH

SCALE 1"=50' | JOB NO E01239 | DRAWING NO D-01239-CV-001 | REV 4

08/15/02 12:56 Filename: D-01239-CV-001.dwg

CE22x34std

IP7010987

Pulverizer Diagnostics

Broken Loading Rod - high ΔP, low amps

Low mill differential

- Throat wear
- Holes in classifier
- Leakage through flap gates
- Improper louver setting
- Obstruction in the feeder
- Feeder out of calibration

Poor Fineness

- Hole in classifier
- Missing flap gate
- Flap gate stuck open
- Low spring pressure

Low spring pressure causes the re-circulating load to increase, since the coal has to pass under the tires several times to be pulverized. Mill ΔP will be higher and power requirements for grinding will be higher.

High mill differential

- Low spring pressure
- Roll wheel not turning
- Buildup of pyrites in the windbox with a pyrite plow failure
- Obstruction in the throat
- Improper classifier louver setting
- Feeder calibration problem

Pulv motor power high

- Spring pressure - A high mill ΔP combined with high power and low fineness indicates the spring pressure is low.
- Condition of grinding elements - The mill power increases when the grinding elements near the end of their wear life. The fineness would be good in this case until you get holes in the roll wheel. The mill ΔP may be a little higher than normal.
- Foreign objects in the grinding ring

Printed out for: GARRY-C - 08-Jan-03 12:10:21

100 Messages U2 Pulv 3 U2 Pulv Diagnostic data 08-Jan-03 12:10:21

Unit 2 900.3 MW	Pulv A	Pulv B	Pulv C	Pulv D	Pulv E	Pulv F	Pulv G	Pulv H
Coal Flow (a's)	47.2	48.8	52.1	48.3	49.0	48.4	Bad	48.9
Coal Flow (b's)	46.4	48.9	52.3	48.3	48.9	48.1	0.0	48.6
Amps	63.5	65.9	62.3	55.1	59.0	61.9	0.0	62.0
PA Damper Pos	82.2	71.8	70.5	68.2	70.1	74.9	0.7	74.2
PA Flow %	97.8	94.2	89.9	81.1	88.4	93.5	8.5	86.5
Pulv In Temp Comp	314.2	303.2	335.3	381.9	351.3	370.3	71.7	360.2
Pulv Inlet Temp	313.3	301.2	327.9	376.4	349.0	364.2	71.4	355.7
Pulv Pitot DP	3.52	3.58	3.17	2.74	2.94	3.74	0.02	3.32
Pulv Pitot DP @	3.84	4.30	3.98	4.02	3.76	4.18	4.17	4.41
100% PA Flow/350	F	(Duct Pr	43.0)					
Pulv DP	14.2	15.6	12.7	7.5	15.2	17.0	0.0	17.5
PA Mass Flow	3938.	3744.	3570.	3245.	3511.	3709.	338.	3462.
Coal Pipe Vel	4398.	4185.	3980.	3603.	3918.	4124.	333.	3860.
Pulv Outlet Temp	151.1	151.9	150.4	150.9	150.9	148.4	79.3	150.6
Coal Bias	-2.6	0.0	5.0	0.0	0.0	0.0	0.0	0.0
Air Bias	9.0	6.1	0.0	0.1	0.0	6.0	0.0	0.0

EndTim= 08-Jan-03 12:10:21 /EvalTim= 08-Jan-03 12:10:21 /PanRate= 0

IP7010989

Printed out for: GARRY-C - 08-Jan-03 12:10:50

100 Messages O2 Data O2 Unit Comparisons 08-Jan-03 12:10:50

Data		Unit 1	Unit 2
Meas'd Load	MW	869.00	900.25
East Probe 1	% O2	3.44	2.72
Probe 2	% O2	6.23	2.60
Probe 3	% O2	3.32	3.45
Probe 4	% O2	2.69	3.15
Average	% O2	3.85	2.80
West Probe 5	% O2	2.98	2.39
Probe 6	% O2	2.65	1.71
Probe 7	% O2	4.25	1.17
Probe 8	% O2	2.20	0.83
Average	% O2	3.03	1.42
Econ O2 Out Average	% O2	3.44	2.09
Econ O2 Out Setpoint	% O2	3.91	3.16
O2 Trim Setpoint		47.5	36.5
Total Air %		78.8	76.1
Coal Flow	TPH	343.6	343.0
# of Pulv In-service		6.	7.
Main Steam Pressure		2393.4	2199.0
Stack NOx	PPM	199.	238.
Scrubber NOx	PPM	216.	254.
Stack Converted NOx	LB/MBTU	0.341	0.395
Target NOx	LB/MBTU	0.436	0.365
Scrubber Inlet SO2	PPM	371.3	341.6
PSH/RH Bias Damper Position		57./ 35.	95./ 100.
MS/RH Temps		998.8/ 996.2	1005.3/ 996.5

SA Damper	Unit 1	Unit 2
A Pulv	90.	67.
B Pulv	90.	71.
C Pulv	10.	77.
D Pulv	10.	71.
E Pulv	90.	71.
F Pulv	90.	70.
G Pulv	90.	97.
H Pulv	84.	70.

Coal Bias	Unit 1	Unit 2
A Pulv	0.0	-2.6
B Pulv	0.0	0.0
C Pulv	0.0	5.0
D Pulv	0.0	0.0
E Pulv	0.0	0.0
F Pulv	0.0	0.0
G Pulv	0.0	0.0
H Pulv	-7.5	0.0

PA Bias	Unit 1	Unit 2
A Pulv	6.6	9.0
B Pulv	0.0	6.1
C Pulv	1.8	0.0
D Pulv	0.0	0.1
E Pulv	15.0	0.0
F Pulv	15.0	6.0
G Pulv	3.9	0.0
H Pulv	10.9	0.0

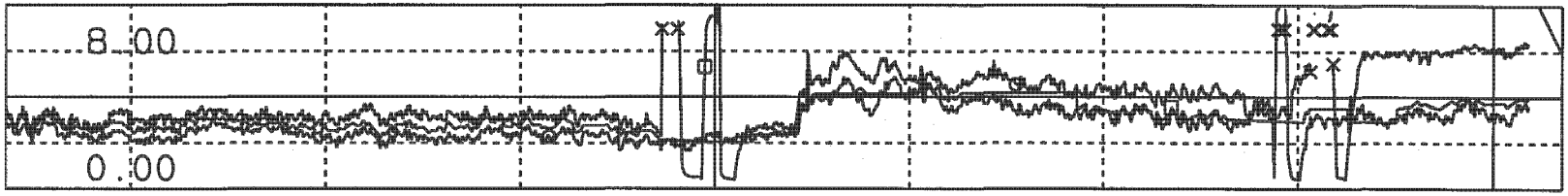
EndTim= 08-Jan-03 12:10:50 /EvalTim= 08-Jan-03 12:10:50 /PanRate= 0

IP70109O

Printed out for: GARRY-C - 08-Jan-03 12: 11: 22

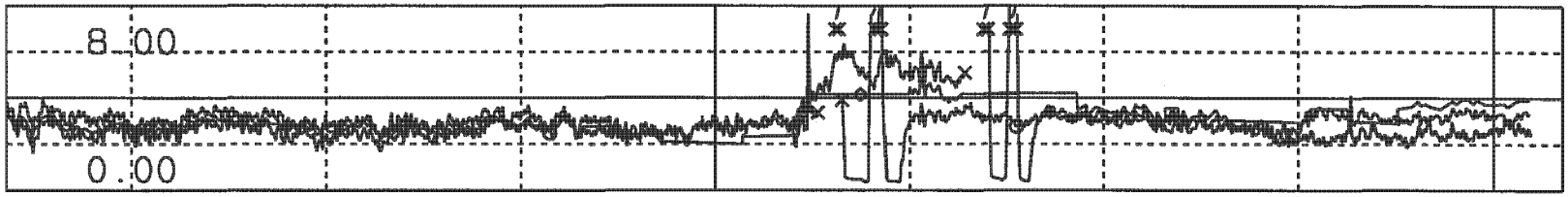
100 Messages O2 STUDY U1 O2 STUDY TRENDS 08-Jan-03 12: 11: 22

EAST O2 PROBES 1A - 2A - AVE EAST SIDE



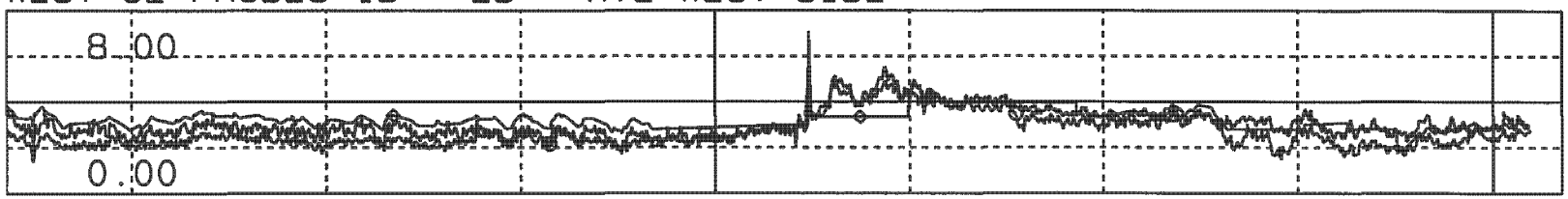
□ 3.62
○ 6.32
◇ 4.0

EAST O2 PROBES 3A - 4A - AVE EAST SIDE



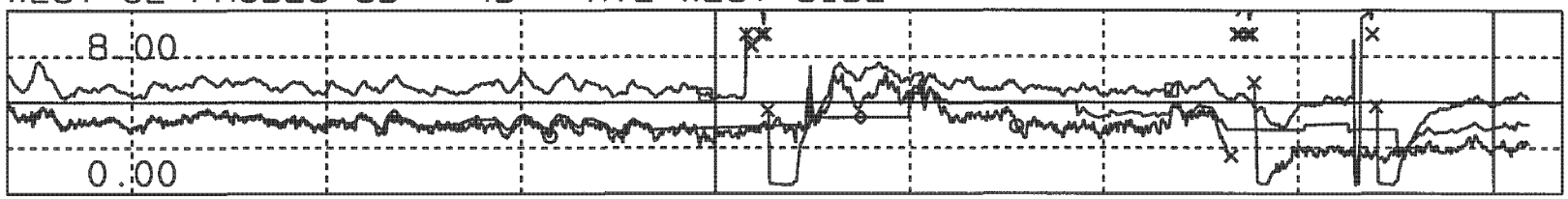
□ 3.39
○ 2.70
◇ 4.0

WEST O2 PROBES 1B - 2B - AVE WEST SIDE



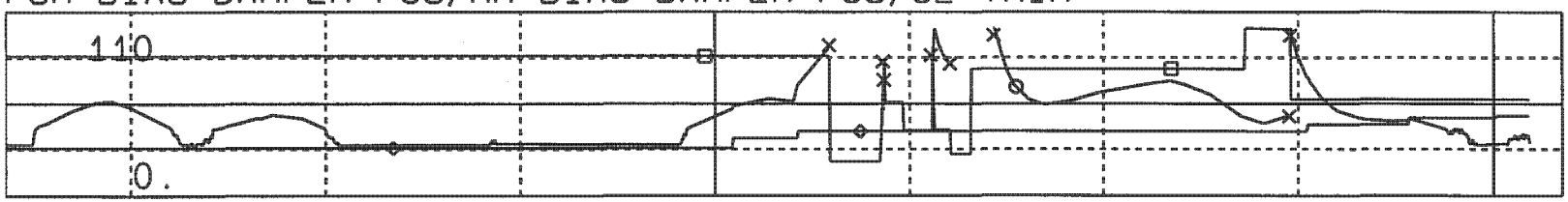
□ 3.16
○ 2.72
◇ 3.0

WEST O2 PROBES 3B - 4B - AVE WEST SIDE



□ 4.20
○ 2.08
◇ 3.0

PSH BIAS DAMPER POS/RH BIAS DAMPER POS/O2 TRIM



□ 57.
○ 35.
◇ 47.5

08-Jan-03 04: 21: 03 08-Jan-03 12: 21: 03 1hr/div 08-Jan-03 12: 21: 03

IP7010991

Printed out for: GARRY-C - 08-Jan-03 06: 47: 30

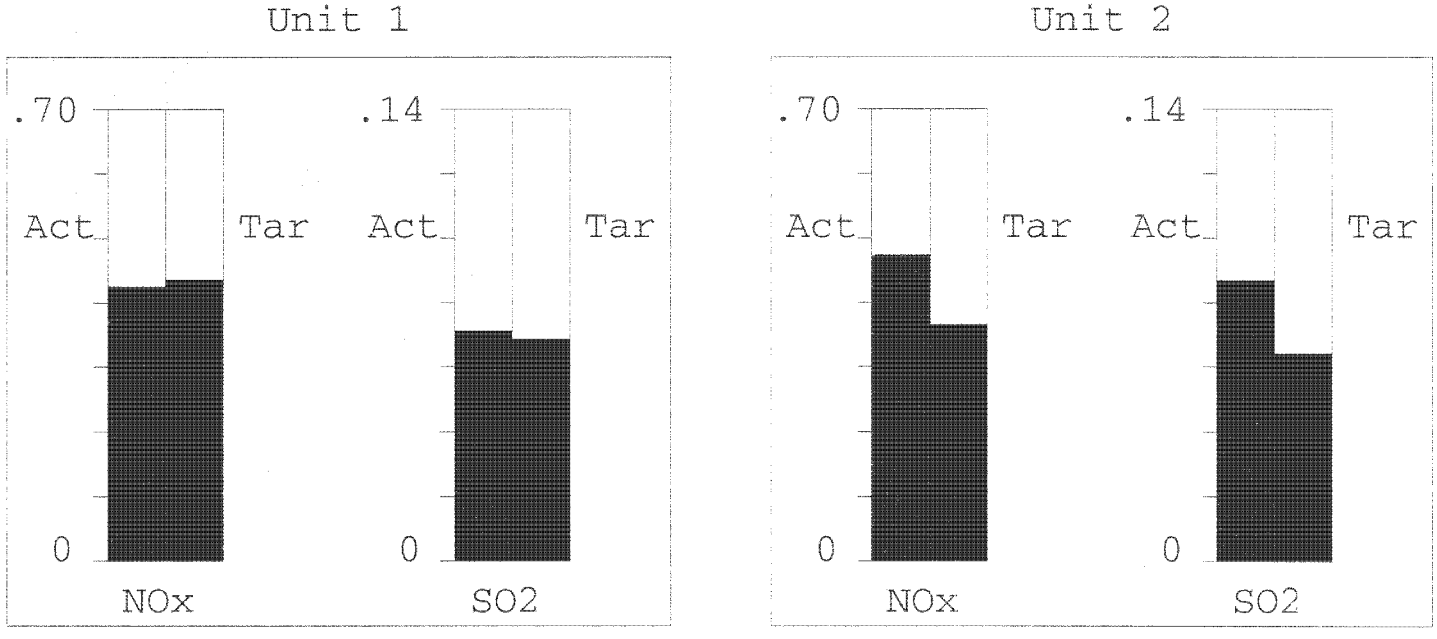
100 Messages U1 PULV 4 Green Black Clear Solid St OFF 08-Jan-03 06: 47: 30

UNIT 1 MC3	DAILY RUNNING TOTAL (TONS)	COAL BIAS	DAILY HOURS IN-SERVICE
A FEEDER	1179.	0.0	23.7
B FEEDER	1230.	0.0	23.7
C FEEDER	1200.	0.0	23.7
D FEEDER	1214.	0.0	23.7
E FEEDER	0.	0.0	0.0
F FEEDER	1192.	0.0	23.7
G FEEDER	1190.	0.0	23.7
H FEEDER	1070.	-6.9	23.7

UNIT 2 MC3			
A FEEDER	1123.	-2.5	23.7
B FEEDER	1173.	0.0	23.7
C FEEDER	1246.	5.0	23.7
D FEEDER	1184.	-2.0	23.7
E FEEDER	1172.	-2.0	23.7
F FEEDER	1061.	1.0	22.0
G FEEDER	0.	0.0	Under
H FEEDER	1165.	0.0	23.7

Printed out for: GARRY-C - 07-Jan-03 14:50:21
100 Messages OP ENVIR NOx/SO2 Targets 07-Jan-03 14:50:21

	Unit 1	Unit 2
Load, gross MW	876.50	902.75
Scrubber Inlet SO2 PPM	545.3	541.9
Actual NOx lb/mbtu	0.43	0.47
Target NOx lb/mbtu	0.43	0.36
Actual SO2 lb/mbtu	0.071	0.087
Target SO2 lb/mbtu	0.068	0.064



EndTim= 07-Jan-03 14:50:21 /EvalTim= 07-Jan-03 14:50:21 /PanRate= 0

IP7010993

Stack NOx Target Remain

Input Equation

(2894.5 * 2000) / ('2SGAPE0049^ * (2160.0-168.0))

(tons left) (Heat input from Curve) (time left) (Planned outage time left)

MBTU/hr

Scheduling: /[X]\Natural
|[ ] Clock: Period = [ ]h [ ]m [0]s Offset = [ ]h [ ]m [0]s
\[ ]/Event

Event Equation

Output clamping:
/[X]\None
|[ ] Under range
|[ ] Over range
\[ ]/Under & over

Scan:
/[X]\ON
\[ ]/OFF

IP7010994

WEPCO Projections

Unit2	NOx	SO2
Baseline[1]	13163.0	1931.2
So Far (tons)	10268.5	1423.7
Yet to go (tons)	2894.6	507.6
Rate to meet[2]	0.385	0.067
Year end at current rate[3]	130.0	-88.2

Unit 1	NOx	SO2
Baseline[1]	13419.5	1855.4
So Far (tons)	10472.7	1392.0
Yet to go (tons)	2946.8	463.4
Rate to meet[2]	0.437	0.069
Year end at current rate[3]	-699.9	-164.7

Plant	NOx	SO2
Baseline[1]	26591.5	3787.5
So Far (tons)	20741.2	2815.7
Yet to go (tons)	5850.3	971.8
Rate to meet[2]	0.410	0.068
Year end at current rate[3]	-570.7	-255.1

([1]Tons per year. [2]lb/mmbtu. [3]Actual projected tons over WEPCO, but not necessarily unaccounted.)

Assumptions: Same average heat input rates as since 4/1/02 (U2:7738mmbtu/hr; U1:7589mmbtu/hr). Accounts for a 31 day outage on Unit 1, and a 9 day outage on Unit 2. NOTE: To account for outages, Unit 2 rates could be increased by 4%. The table already accounts for outage adjustments on Unit 1 rates, which decreased by 13%. Data through Dec. 2002.

Was 250.9 gained ground (120.9 tons from last month)

was -52.2 good shape

was -628.8 in good shape, good shape

was -160.4

Was -380.1 good shape

was -215.8 good shape

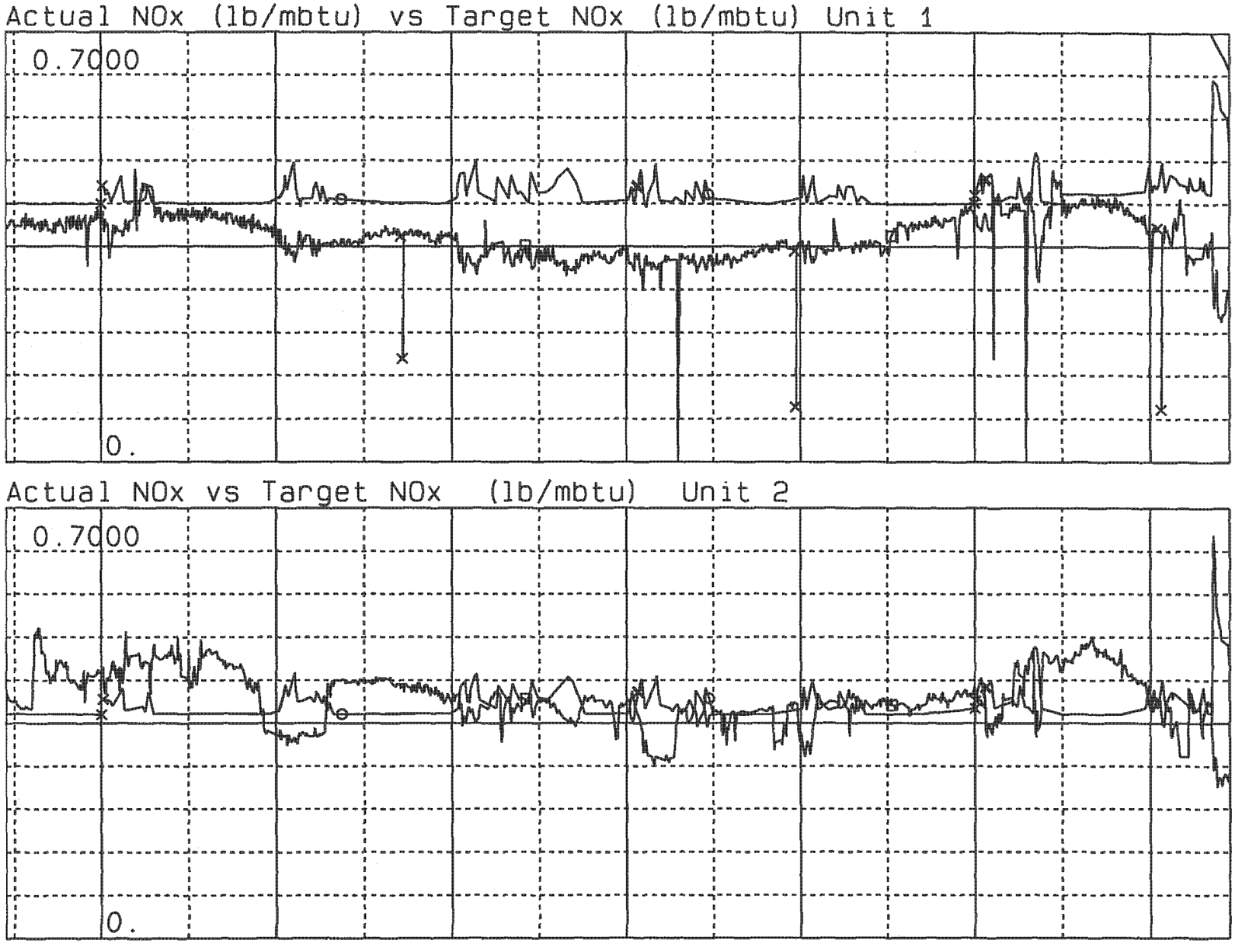
have January, February, & March left.

U2 NOx: at end of October was 398.9 tons
at end of November was 250.9 tons (dropped 148 tons)
at end of December was 130.0 tons (dropped 120.9 tons)

IP7010995

Printed out for: GARRY-C - 08-Jan-03 10:47:55

100 Messages NOx NOx Actual vs Target 08-Jan-03 10:47:55



01-Jan-03 10:47:32 08-Jan-03 10:47:32 12hr/div 08-Jan-03 10:47:32

IP7010996